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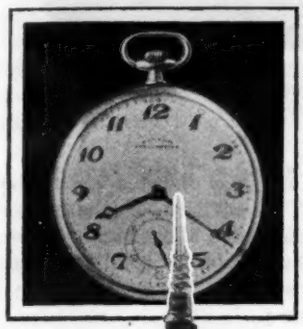


Nickel-Chromium Steels More Widely Used

Standard Methods for Heat Treating and Processing Are Developed—Potential Demand Increases

By E. C. Kreutzberg

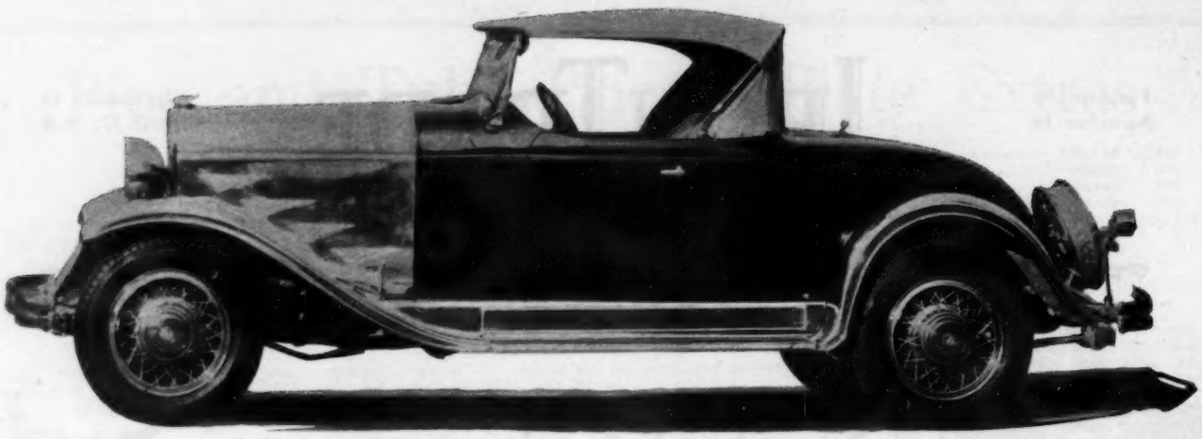
Associate Editor, Iron Trade Review

EASILY the most phenomenal development in the metals field during the past year has been the rapid progress in connection with the introduction of nickel-chromium corrosion and heat-resistant steel in this country. Numerous problems of production have been overcome, so that the material now is available in the principal rolled forms. Research work has resulted, by means of slight variations in analyses, in making this alloy useful for purposes which originally it did not serve. The details of heat treatment and of the various methods of processing this alloy have been worked out completely.

STEEL that beautifies a watch or a skyscraper is being used to ornament the Chrysler building, New York. The metal is being fabricated in a complete metalworking shop located on the seventy-eighth floor

Last year, that is, the calendar year of 1929, the output of nickel-chromium steel, of the so-called 18 and 8 analysis (18 per cent chromium and 8 per cent nickel) aggregated fully 25,000 tons in the United States. The 1930 production will be much larger. Potential demand is far ahead of producing capacity, and indications are that distribution and consumption of this metal for some time to come will be limited only by the extent to which the finishing capacity will make it available for the market.

Although the standard nickel-chromium is the one referred to as 18 and 8, there are some variations in analysis, depending on applications. The data shown in Table I have been worked out by the Krupp Nirosta Co. Inc., and its licensees, who allude to this alloy as Nirosta KA2, an abbreviation for Krupp



KA2 metal in the form of spun and drawn sheets, strip, wire and castings are used for such automotive parts as the radiator, lamps, trim, wheels, fenders, hood and hardware

Austenitic No. 2. For many purposes requiring resistance to corrosion, this alloy has been found to be entirely suitable. This alloy, austenitic in structure and nonmagnetic when properly treated, can be welded, worked, machined and formed. Unpolished but properly heat treated and pickled, it is absolutely rust-resisting in a moist atmosphere. This heat treatment is opposite to that generally used on ordinary steels. It consists of heating the alloy quickly within the range of 2050 to 2150 degrees Fahr. and then rapidly cooling. In view of the fact that carbon has a large influence on the corrosion resisting ability of this alloy steel, it is interesting to note that heat treatment puts in solution all of the carbon contained in the nickel-chromium alloys. The result is a metal of high ductility. Results obtained in research work show that it always is preferable to cool the nickel-chromium alloy as rapidly as posible from the high temperature. Air cooling usually is sufficient with the thinner sections, whereas with larger pieces water quenching is required.

Austenitic chrome-nickel alloy steel cannot be hardened by any heat treatment, but cold-working will harden it to a considerable degree. For this reason it is necessary, after certain reductions have been taken to heat treat the metal in order to soften it for subsequent cold working.

Product May Be Welded

Oxyacetylene and electric methods of welding may be applied with equal success to austenitic chrome-nickel steel. In both cases, welding rods of the same material must be used. It also can be spot welded and resistance welded in thicknesses not exceeding 16 gage. The readiness with which the metal responds to welding makes it feasible to weld almost any articles which formerly had to be riveted, and, at the same time, allows the use of lighter gage material.

A variation of chrome-nickel alloy has been developed for some requirements of the paper industry. This is obtained by adding about 3 per cent molybdenum to the Nirosta KA2 analysis. The KA2 alloy is used in the paper industry on paper machines, for stay-boards, suction boxes, Fourdrinier screens, dandy rolls, etc., whereas the same alloy with about 3 per cent molybdenum is used in the digesters and the digester circulation system. The addition of the molybdenum makes the alloy highly resistant to the action of boiling acetic acid and sulphite liquors under heat and pressure.

Certain modifications in the KA2 metal have been found to make the alloy exceedingly useful in meeting exacting requirements where temperatures, pressures and corrosive action all are present in high degree. A

Complete Data Never Before Published

WITH the rapidly expanding use of 18 *per cent chromium-*8 *per cent nickel steels has come an insistent demand for accurate and complete information on chemical specifications, physical properties, heat and corrosion characteristics, processing and fabricating methods. These alloys, commonly referred to as the* 18-8 *steels, were developed in Germany by the Krupp interests and are made and processed in the United States under licenses granted by the Krupp Nirosta Co. Inc., New York. The accompanying article, the first of two parts, constitutes the first authentic and comprehensive discussion of the new steels and has been compiled by* IRON TRADE REVIEW *from data supplied by the licensees. The material never before has been published. The second part to appear in the April* 24 *issue of* IRON TRADE REVIEW *will continue on with fabricating methods and in addition will contain a complete list of licensees.*

Table I

Chemical and Physical Qualifications

Chemical Properties

Element	Per cent
Carbon, under	0.16
Manganese, under	0.50
Silicon, over	0.50
Chromium	17.00 to 20.00
Nickel	7.00 to 10.00
Phosphorus, maximum	0.025
Sulphur, maximum	0.025

Average Physical Properties

(2100 degrees Fahr. water quench)	
Tensile strength, lbs. per sq. in.	85,000 to 95,000
Yield point, lbs. per sq. in.	30,000 to 40,000
Elongation, % in 2 in.	55 to 60
Reduction in area, %	70 to 75
Brinell	135 to 145
Izod, ft. lbs.	115 to 120
Charpy, ft. lbs.	100 to 110
Specific gravity	7.86
Heat conductivity, gram calorie per centimeter cube per second per 1 degree Cent.	0.052
Specific heat	0.118
Melting point, degrees Fahr.	2550
Specific resistance:	
microms at 68 degrees Fahr.	73.0
microms at 212 degrees Fahr.	90.0
microms at 932 degrees Fahr.	106.0
microms at 1472 degrees Fahr.	111.8
Coefficient of linear expansion, per degree Cent:	
0 degrees to 100 degrees Cent.	0.000016
0 degrees to 600 degrees Cent.	0.000018
0 degrees to 1000 degrees Cent.	0.000020
Modulus of elasticity, lbs. per sq. in. 27,000,000 to 30,000,000.	

modification in the KA2 analysis is being used for making tubes used in oil-cracking stills, operating under temperatures of 850 to 1300 degrees Fahr., under pressures from 750 to 3500 pounds per square inch, and engaged on highly corrosive crude oil. These tubes show such high resistance to this use that their life, after 10,000 hours of operation, has not yet been determined.

Another modification in analysis has made it possible to increase working temperatures to 1850 degrees Fahr., still retaining the same easy workability, the same resistance to corrosion, and the same ability to withstand high pressures as the ordinary 18 and 8 alloy.

Product Has Wide Application

Present uses of Nirosta KA2 alloy cover a wide field in the metalworking industry. It is being used extensively in many forms in all major industries, particularly in chemical and allied plants, electrical, automotive, paper, food, dairy, mining, oil and building industries, etc., and table utensils. It is being made into milk cans, barrels, dental plates, metallic mirrors and into parts of pumps, nozzles, plungers, pistons, piston rods, etc. In the food industry use is made of welded tubing made out of polished strip, so as to obtain tubes which are polished inside and outside; these tubes are installed in pasteurizers, cooking tables, boiling vats, storage vats, conveyors, etc. Uses in the chemical industry include distillation installations, digesters, evaporating pans, heating coils, mixers, acid towers, condensers and similar apparatus.

Companies licensed under the patents of the Krupp Nirosta Co. Inc. have prepared exhaustive data covering all phases of Nirosta KA2. Data compiled by these licensees covering corrosion resistance of heat treated and annealed Nirosta KA2, as compared with plain carbon steel, when exposed to dilute solutions, show losses in weight in grams per square meter after exposure for 100 hours at 20 degrees Cent. (68 degrees Fahr.) The data are shown in Table III.

The resistance of Nirosta KA2 to air, gases and water, taking common steel on the basis of 100, is shown in Table IV. Corrosion of heat treated and annealed Nirosta KA2, when attacked by commercial chemicals, develops as shown in Table II.

Table II

Losses by Exposure to Various Chemicals

	Temperature, degrees Cent.	Grams per hour per sq. meter
Nitric acid, 1:10	20	0.00
Nitric acid, concentrated	20	0.00
Nitric acid, 1:1	Boiling	0.04
Nitric acid, concentrated	Boiling	0.02
Nitric acid plus 5% sulphuric acid	Boiling	0.59
Sulphuric acid, 10%	20	0.07
Sulphuric acid, 30%	20	0.16
Sulphuric acid, 66%	20	0.001
Sulphuric acid, 98%	20	0.012
58% sulphuric acid, 40% nitric acid, 2% water	20	0.00
58% sulphuric acid, 40% nitric acid, 2% water	60	0.05
58% sulphuric acid, 40% nitric acid, 2% water	100	0.7
10% sulphuric acid saturated with copper sulphate	20	0.00
Acetic acid, 1:1	Boiling	0.03
Acetic acid, concentrated	Boiling	0.60
Phosphoric acid, 10%	Boiling	0.01
Phosphoric acid, 45%	Boiling	0.04
Sulphurous acid plus 1% sulphuric acid	10	0.05
Boric acid, concentrated	100	0.00
Oxalic acid, concentrated	20	0.00
Oxalic acid, concentrated	40	0.01
Lactic acid	20	0.00
Butyric acid	20	0.00
Butyric acid, saturated	130	0.00
Oleic acid	150	0.03
Gallic acid, saturated	Boiling	0.00
Linseed oil plus 3% sulphuric acid	200	0.05
Carbolic acid, crude	90	0.05
Citric acid, 5%	Boiling	0.00
Sodium chloride, saturated	Boiling	0.10
Sodium chloride, 25%	Boiling	0.03
Sodium chloride, 10%	Boiling	0.00
Sodium sulphide, 1:1	90	0.02
Potassium chlorate, saturated	Boiling	0.00
Potassium hypochlorite	20	0.01
Potassium hypochlorite	105	0.53
Potassium bitartarate, saturated	Boiling	0.09
Ammonium nitrate	107	0.02
Copper nitrate, 1:1	Boiling	0.00
Copper sulphate, 1:1	Boiling	0.00
Zinc chloride degrees beryllium	35	0.04
Stannuous chloride	50	0.27
Nitre	20	0.52
Mercuric bichloride 0.7%	20	0.88
Ammoniacal water	Boiling	0.00
Calcium chloride	100	0.00
Ammonium chloride	Boiling	0.00
Sodium hydroxide, 20%	110	0.02
Sodium hydroxide, 34%	100	0.00
Sodium hydroxide	318	0.22
Potassium hydroxide, 27%	Boiling	0.00
Potassium hydroxide, 50%	Boiling	0.40
Chlorine, iodine and bromine and their halogen acids		dissolve

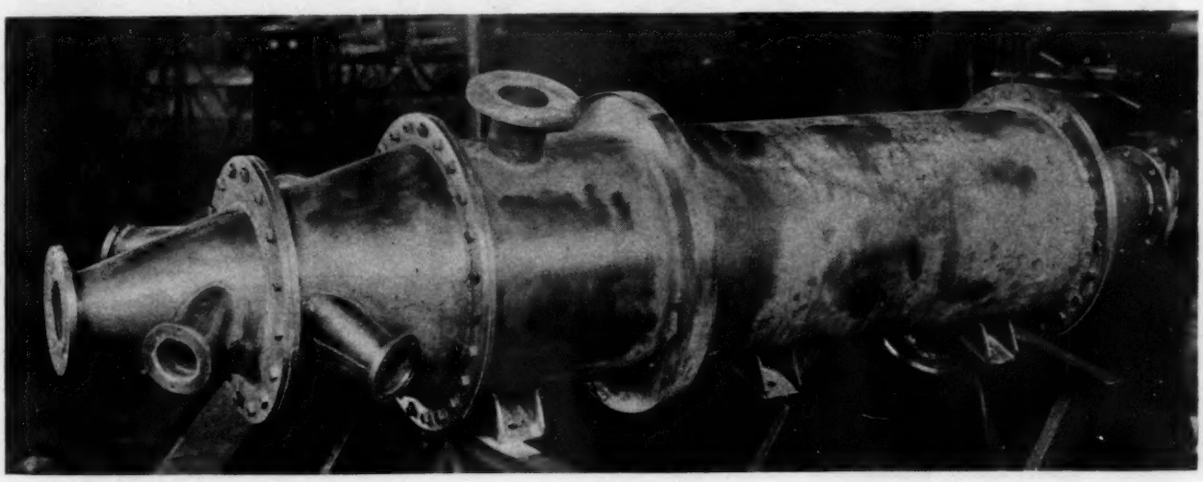
Fabrication Is Diversified

Complete data covering all phases of the fabrication of Nirosta KA2, as developed by the Krupp Nirosta Co. Inc. and its licensees are as follows:

FORGING: Nirosta KA2, having greater strength and hardness at high temperatures, will of necessity be somewhat stiffer than other metals and will require more blows under the hammer to accomplish the same reduction. Forging should be carried out as follows:

1. Billets less than 10 square inches cross section.
   Heat quickly to about 2200 to 2250 degrees Fahr. Do not soak. Commence forging at this temperature and finish not below 1850 degrees Fahr.
   If forging cannot be completed in one heating, the forging should be returned to the furnace and reheated to the proper temperature.
2. Billets larger than 10 square inches in cross section.
   Preheat and soak billet to 1500 degrees Fahr. maximum. Then raise the heat rapidly to 2200 to 2250 degrees Fahr. Do not soak at the high heat. Then forge as previously mentioned.
   (Note: In any case, the first blows of the hammer should be light.)

In order to obtain full corrosion re-



Heat exchanger used in the manufacture of nitric acid. The unit is constructed of nickel-chrome plates, sheets and seamless tubes by welding

Table III

Losses by Exposure to Dilute Solutions

Solutions	Grams per square meter Common steel	KA2
Well water	1.00	0.00
Pure water and CO_2	28.03	0.03
Magnesium chloride, 0.5%	5.44	0.00
Sodium chloride, 2.5%	5.00	0.00
Sulphuric acid, 1/10 normal	191.00	0.05
Hydrochloric acid, 1/10 nor.	191.00	0.15
Nitric acid, 1/10 normal	147.50	0.00
Sulphurous acid, 1.5%	491.00	0.00
Acetic acid, 1/10 normal	29.6	0.00
Tartaric acid, 1/10 normal	54.8	0.00
Tannic acid, 1/10 normal	38.0	0.00

sistance and best machinability, the Strauss heat treatment should be applied. This consists of heating the forging rapidly to 2050 to 2150 degrees Fahr. and quenching in water. Do not soak the forgings at the high heat. After the heat treatment, the forgings should be pickled.

HEAT TREATMENT: To secure the best service from Nirosta KA2 it is essential that it be used in the heat treated (annealed or softened) condition. The steel then has its greatest resistance to corrosion and oxidation and is, therefore, most ductile and in the best condition for bending, forming, deep drawing, etc. For this reason all Nirosta KA2 is given the necessary special processing during the course of manufacture. To emphasize this point the various treatments are mentioned in their proper places in these instructions.

In general, the Strauss heat treatment consists in heating Nirosta KA2 rapidly to a high temperature (2050 to 2150 degrees Fahr.) and cooling rapidly either by quenching or, in the case of thin sections, by air cooling. It should be noted that in contrast to the usual annealing of ordinary steel KA2 must be cooled quickly from the high temperature. This same general treatment is used for softening the metal. After the drawing or forming operations the steel becomes hardened due to cold working and further softening is necessary for subsequent drawing, rather than the annealing with slow cooling, as is customary with ordinary carbon steel.

Procedure for Bending

EXPANDING, ROLLING, BELLING, FLANGING AND BENDING OF TUBES, ETC.: KA2, when properly heat treated is tough and ductile at room temperature and the various operations of expanding, rolling, belling, flanging and bending can be done at room temperature. For bending to short radii, however, the material should be heated between 1000 and 1200 degrees Fahr. and in cases where the equipment is not sufficiently strong to handle steel at these low temperatures, the metal should be heated between 1900 and 2200 degrees Fahr. For bending, upsetting or vanstoning, however, Nirosta KA2 never should be heated in the range from 1200 to 1900 degrees Fahr. After complicated forming, the work should receive the Strauss heat treatment, as outlined in the section on heat treating.

PICKLING FOR REMOVAL OF SCALE: Before pickling, Nirosta KA2 preferably should be in the heat treated condition. The standard pickling treatment, which produces the usual gray pickled finish, follows:

Table IV

Losses by Exposure to Air and Water

	Grams per square meter KA2	Common steel
Air	0.0	100
Air, heavy with smoke	0.86	100
Air stream, 1292 degrees Fahr.	0.5	100
Air stream, 1508 degrees Fahr.	1.5	100
Well water	0.0	100
Sea water	0.6	100
Superheated steam and air at 752 degrees Fahr.	5.9	100
Mixture of steam, air and sulphurous acid at 752 degrees Fahr.	2.5	100
Mixture of steam, air and hydrochloric acid at 752 degrees Fahr.	9.5	100
Mixture of steam, air and ammonia at 752 degrees Fahr.	0.72	100

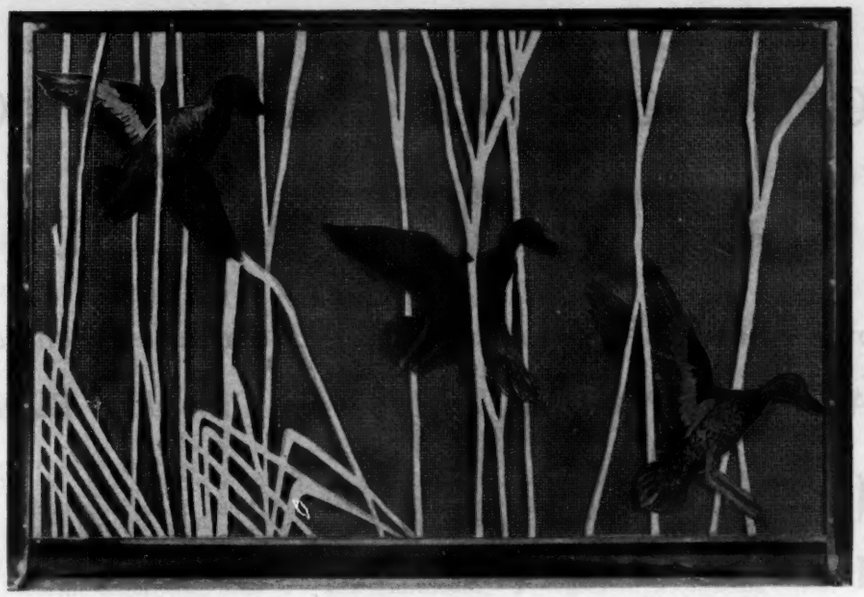
Use a solution of 50 per cent hydrochloric acid at a temperature between 100 and 150 degrees Fahr. Where such acid is not available a solution containing about 10 per cent sulphuric acid and 6 to 12 per cent rock salt by weight should be used hot. The effect of the rock salt is to liberate hydrochloric acid and results in a considerable saving of time as compared with the straight sulphuric acid pickle. After pickling rinse thoroughly and dip in a hot solution of nitric acid, 10 to 20 per cent strength, and wash carefully in hot water.

The original Krupp pickle for bright finish has the following composition:

500 parts, by weight, water.
500 parts, by weight, hydrochloric acid.
50 parts, by weight, nitric acid.

Main kitchen in the Royal bank, Canada, which is provided with steam cookers and tables, utensils, and other equipment made of nickel-chrome alloy

Fireplace screen of nickel-chrome strip, wire and sheets



Brightness and colorwork thus are retained indefinitely

Temperature of bath 100 to 150 degrees Fahr.

A somewhat cheaper pickling bath, which will give a similar bright finish, has the following composition:

700 parts, by weight, water.
200 parts, by weight, hydrochloric acid.
50 parts, by weight, sulphuric acid.
Temperature of bath 150 degrees Fahr.

For pickling tanks the use of acid-proof tile, laid up with a good grade of acid-proof mortar, is recommended. A Duriron steam jet should be used for heating the solution. Two pickling methods applicable to either solution can be employed.

1. Leave the steel in the solution only sufficiently long to loosen the scale. Then wash and scrub and put back into the same solution for a short period.
2. Leave the steel in the solution for a slightly longer period totaling about 10 minutes. Then wash, rinse and dry.

Good results may be obtained in the washing and scrubbing operation by the use of a sand waterstream under pressure or by tumbling in a barrel filled with sand and water of the consistency of a sludge. In any event, the sand must never have been used for cleaning any other material, else the Nirosta KA2 will be contaminated, resulting in possible discoloration in service. The foregoing pickling methods produce a bright silver gray finish.

Suitable for Rivets

RIVETING: Nirosta KA2, is an extremely satisfactory material for rivets. It does not harden on rapid cooling nor develop a coarse crystalline structure on heating and, therefore, the accurate temperature control required for straight chromium iron rivets is not necessary. KA2 rivets may be driven at high temperatures (1850 to 2100 degrees Fahr.) or cold within limited sizes with equal success, the rivets remaining tough and entirely dependable. Rivets of KA2, however, should not be soaked at the high heat driving temperatures.

WELDING: Nirosta KA2 may be welded either by the acetylene torch or electric arc, using specially prepared welding rods. It also may be spot and resistance (line) welded, but cannot be hammer welded. Due to freedom from any air hardening tendency, welds in this metal remain tough and ductile. Since conditions vary with the work to be done, even a competent welder may need to experiment slightly to develop the right practice. The following instructions are broad and designed to fit the average case, but should be sufficientl definite to guide the work.

Edges Should Be Chamfered

For acetylene welding, uncoated rods must be used, the size of the rod being approximately equal (up to about 3/16-inch) to the thickness of the metal to be welded. With plates and other heavy material, chamfer the edges to be welded and place these a small distance apart. Build up a bead between these edges keeping the flame of the torch pointed in the direction of the welding so as to preheat the work. Do not attempt to go over the weld or puddle it. A slight excess of oxygen should be used so that the flame will be neutral. The flame should be no larger than necessary for the work to be done.

A neutral short flame can only be retained by the use of a slight excess of oxygen. A long, yellow flame always indicates an excess of acetylene, which will increase the carbon content of the metal in the weld. This produces not only a brittle weld, but also a weld of lessened corrosion resistance.

For electric (arc) welding, coated welding rods must be used. Adjust polarity so that the electrode is the positive and the work the negative terminal. Also arrange the work so that the welding will be done in the direction from which the current is flowing; in other words, "Buck the current." The welding machines should be regulated to give the following current:

3/32-inch rod, 35 to 40 volts open circuit with 50 to 75 amperes.
⅛-inch rod, 40 to 45 volts open circuit with 75 to 100 amperes.
5/32-inch rod, 50 to 60 volts open circuit with 100 to 125 amperes.
3/16-inch rod, 55 to 65 volts open circuit with 150 to 175 amperes.
¼-inch rod, 70 to 80 volts open circuit with 225 to 300 amperes.

As in acetylene welding the thickness of the rod should approximate (up to about 3/16-inch) that of the material being welded. When laying a heavy bead, it is advisable whenever possible to lay several beads, one on top of the other, rather than to attempt to lay a heavy bead at one operation. It is important to remove the slag formed, by scraping, wire brushing, or with an air hammer and blunt tool before laying succeeding beads.

The first cast-iron bridge in Europe was built by Abraham Darby, construction commencing in 1776 and completed in 1779. It spanned the Severn river at Coalbrookdale, England.

Auction Develops Low Prices for Used Machinery Items

Bargain Hunters Find Many Good Buys as Entire Equipment and Stock of Automobile Plant in Cleveland Are Placed on Block

GOING, going,—gone! By which is meant the entire plant equipment and stock of the F. B. Stearns Co., Cleveland, builder of the late Stearns-Knight automobile, which folded up about four months ago and decided to auction off all equipment. For three days last week, Tuesday, Wednesday and Thursday, the hoarse voice of the auctioneer echoed and reechoed through the silent buildings on Euclid avenue while an excited group of bidders clustered about the machinery, picking out the flaws, each one figuring how he could get something for nothing.

Prices Fairly High

General opinion was that prices bid were fairly high for auction sale, the feeling being that a used machinery dealer would not have fared so well in the attempt to corner much of the equipment for resale. Many of the sales were to operators who intended installing the equipment in their own plants and hence were not unwilling to bid prices up. It was estimated that approximately 350 were in attendance each of the three days of the auction, many of whom came to look and not to bid. Buyers from Jamestown, N. Y., Long Island City, N. Y., Pittsburgh and other machinery centers were prominent bidders.

Condition of the equipment was considered fair, many older types of machines going on the block and finding bidders, nevertheless; and what new tools and equipment were put up, found ready and spirited bidding. A rumor was afloat that some of the newer equipment in the plant had been purchased and removed before the auction. However, practically all equipment listed in the auctioneers' catalog was on the floor. Generous quantities of oil had been applied to most machines and the auctioneer's cry of, "How much am I bid for this beautiful tool," was not far wrong.

An outstanding bargain was a 50/75-horsepower laboratory-test electric dynamometer completely equipped, which went down the river for $150. Electric motors were sold at prices ranging from $2 to $45 per horsepower, the higher prices applying to smaller and newer motors. Two hundred dollars took a 200-pound Bradley forging hammer and a 50-ton Lucas arbor press with single pulley drive was sold to the man who bid $740.

Some typical prices of equipment sold in the maintenance, pattern and crankcase departments were: Niagara hand bar shear, $60; 16 x 6-inch Cincinnati engine lathe and countershaft, $70; 21-inch Aurora drill, $20; 13-inch Sterling high-speed power hacksaw, $25; 20-inch Rockford drill, $30; 18 x 8-inch American engine lathe, quick change gears, back gear and countershaft, $175; 36-inch American bandsaw with a 3-horsepower motor, $155.

Large Machines Are Bargains

A D-25 Fox multiple-spindle drill with a capacity of 41 ⅜-inch drills hung its head as its new owner admired it at a cost of $1250. The same buyer took the motor, 20-horsepower, for $60. And to the right, gentlemen, is a beautiful 48-inch by 20-foot Ingersoll planer-type slab milling machine whose massive lines completely dwarf the auctioneer as he climbs onto its table to find it a new home. The machine plainly showed signs of usage but after considerable haranguing was bid up to $3000, original cost of the machine being over $10,000.

Two 20-foot electric continuous enameling furnaces with complete conveyors, circulating pumps, motors, heating coils and exhaust blower, the ovens measuring 8 x 18 x 7 feet, when placed on the block found few bidders; finally someone suggested $200 which was pushed up to $275 before the gavel fell and the crowd whistled. Each installation must have cost originally about $5000.

Equipment in the sheet metal department included a Bliss No. 22 inclinable power press which went for $600; and 18-inch Avey drill, $155; 20-kilowatt and 25-kilowatt electric spot welders, $500 and $650; a 10-foot Stamco power squaring shear, $1350; 8-foot George A. Ohl power brake, 3-inch stroke, $1500; and a 28-inch Gisholt vertical boring mill, $700. A Bliss No. 74½ geared power press with 3¾-inch stroke, in good condition except for a large crack across the base of the frame, still was worth $525 of someone's money.

Bidding Is Spirited

The crankshaft department was the scene of more spirited bidding, although the tendency everywhere seemed to be to attempt to make the auctioneer understand your bid without moving your lips or looking at him, a well-known trick of competitors.

A 16 x 48-inch Landis crankshaft grinder, motor driven and with quick change gears, was wrapped up for a bid of $750 while a 12 x 52-inch Landis plain cylindrical grinder impressed some bidder to the extent of $1050, the 10-horsepower motor going along for $65. Another 16 x 48-inch crankshaft grinder was pushed up to $1150 and a 14 x 60-inch Norton plain cylindrical grinder was on its way for four century notes. Two No. 2-B Edlund 16-inch electric drills, each with 1-horsepower motor, brought $95 and $100.

A fair-sized stock of raw material also was auctioned, including steel, aluminum, copper and brass. Approximately 6000 pounds of 20-gage corrosion-resistant sheet steel was sold at a bid of $1.80 per hundred pounds. One thousand pounds of 16-gage sheet aluminum brought 23 cents a pound. A bid of 1½ cents a pound took approximately 6 tons of round cold rolled steel, S.A.E. 1095.

Foundrymen Plan Convention

American Foundrymen's Association Arranges Technical Program for Annual Meet

Public Auditorium in Cleveland, May 12-16, Will House Sessions and Exhibition

TENTATIVE program arrangements have been announced for the thirty-fourth annual convention of the American Foundrymen's association in Cleveland, May 12-16, at the Public auditorium. This year marks the fourth time since the inception of the organization in 1896 that the annual convention has been held in Cleveland, the other years being 1906, 1916 and 1923. An extensive exhibition of foundry equipment is being held in connection with the convention and will be open for inspection each day, in the main arena and annex of the auditorium. Technical sessions, roundtable discussions and shop operation courses are to be held also at the auditorium in the smaller meeting rooms.

Shop Course Expanded

Further expansion of the shop operation course of the foundrymen's association has been sought this year and the course as arranged will include discussion of problems incident to gray iron, steel and nonferrous materials. These courses will be held at 4:00 p.m. on each of the first four days of the convention. Gray iron topics include cupola materials and operation; gating and risering; and high test irons, alloy additions and heat treatment. Subjects for the steel courses are chipping, grinding and riser removal; core room practice; and practical aspects of heat treating. Shop fundamentals of a nonferrous nature to be considered are fuel-fired furnace melting; induction-type electric furnace melting; and indirect arc type electric furnace operation.

Three roundtable sessions will bring up discussion of malleable, steel and nonferrous foundry operation. Other features of the program include an annual exhibitors dinner Tuesday evening at 7:00 p.m., and informal reception by the Cleveland committee Monday evening at 8:00 p.m. and the annual American Foundrymen's association banquet Thursday evening at 7:00 p.m.

The tentative schedule of business meetings, round table discussions, papers and exhibition hours for the five days is as follows:

Monday, May 12

12:00 noon—Exhibition opens and registration begins.
2:00 p.m.—Business session.
4:00 p.m.—Gray iron shop operation course.
8:00 p.m.—Reception by Cleveland committee.
10:00 p.m.—Exhibition closes.

Tuesday, May 13

9:00 a.m.—Exhibition opens.
10:00 a.m.—Foundry costs.
Malleable founding.
12:15 p.m.—Roundtable on malleable founding.
2:00 p.m.—Metallurgical cast iron.
Nonferrous founding.
4:00 p.m.—Steel, gray iron and nonferrous shop operation courses.
5:00 p.m.—Exhibition closes.
7:00 p.m.—Annual exhibitors dinner.

Wednesday, May 14

9:00 a.m.—Exhibition opens.
10:00 a.m.—Management, personnel training.
Wear testing and melting gray iron.
Nonferrous founding.
2:00 p.m.—Sand control.
Management, market survey.
4:00 p.m.—Steel, gray iron and nonferrous shop operation courses.
10:00 p.m.—Exhibition closes.

Thursday, May 15

9:00 a.m.—Exhibition opens.
10:00 a.m.—Steel founding.
Apprentice training.
12:15 p.m.—Roundtable on steel founding.
Roundtable on nonferrous founding.
2:00 p.m.—Metallurgical gray iron.
4:00 p.m.—Steel, gray iron and nonferrous shop operation courses.
5:00 p.m.—Exhibition closes.
7:00 p.m.—Annual banquet.

Friday, May 16

9:00 a.m.—Exhibition opens.
10:00 a.m.—Materials handling.
General shop practice.
5:00 p.m.—Exhibition closes.

Technical Papers Scheduled

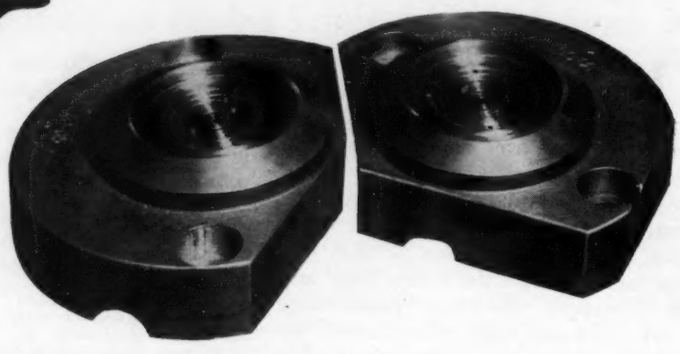
Technical papers now scheduled for presentation at the various sessions are announced as follows:

"A Recommended Standard Cost System for Gray-Iron Foundries," by J. L. Carter, Sacks-Barlow Foundries Inc., Newark, N. J.
"Organizing a Nonferrous Foundry Cost Group," by C. S. Humphries, Westco Chippewa Pump Co., Davenport, Iowa.
"Continuous Melting Process as Applied to Malleable Iron," by B. R. Mayne, Saginaw malleable iron division, General Motors Corp., Saginaw, Mich.
"Factors Affecting Machinability of Malleable Cast Iron," by H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.
"Some Features of the Pulverized Coal-Fired Air Furnaces," by E. F. Wilson, Jefferson Union Co., Lockport, N. Y.
"Effects on Cast Iron of Prolonged Heating at 800-1100 Degrees Fahr.," by R. S. MacPherran and R. H. Krueger, Allis-Chalmers Mfg. Co., Milwaukee.
"Blistering Tendency of Some Cast Iron When Enameled," by A. I. Krynitsky and W. S. Harrison, bureau of standards, Washington.
"Deep-Etch Test of Brass," by W. F. Graham and L. A. Meisse, Ohio Brass Co., Mansfield, O.
"Application of Ingot Metal to Production of Brass and Bronze," by William Romanoff and C. O. Thieme, H. Kramer & Co., Chicago.
"Overcoming Alloy-Ingot Troubles in the Brass Foundry," by W. S. Paulson, Thos. Paulson & Son Inc., Brooklyn, N. Y.
"Briquetting Cast Iron Borings," by H. Rayner, Dodge Bros. Corp., division of Chrysler Corp., Detroit.
"Continuous Melting from Cold Stock of Gray Iron in Electric Furnace," by N. L. Turner, Beach Foundry Ltd., Ottawa.
"Methods for Determining the Volume Changes Undergone by Metals During Casting," by E. J. Ash, research associate, bureau of standards, Washington.
"Care and Maintenance of Fuel-Fired Furnace Linings in the Nonferrous Foundry," and "Selection and Use of Refractory-Maintenance Cement in the Nonferrous Foundry," by H. E. White, Lava Crucible Co., Pittsburgh.
"Stronger Aluminum Castings by Improved Foundry Practice," by E. M. Gingerich and H. J. Rowe, Aluminum Co. of America, Pittsburgh.
"Progress in Die-Casting Industry," by Marc Stern, A. C. Spark Plug Co., Flint, Mich.
"Sand Control as Viewed from the Producers' Standpoint," by W. W. Kerlin, Enterprise Sand Co., Pittsburgh.
"The Value of Sales Analysis and Market Research," by J. P. Newman, McGraw-Hill Publishing Co., New York.
"The Value of Cleanliness and Neatness in a Foundry," by Edward Trapken, Sandusky, O.
"Reclaiming Steel Foundry Sands," by M. D. Pugh, Illinois Testing Laboratories Inc., Chicago.
"Australian Steel Foundry Practice," by D. Clark, Adelaide, Australia. (Submitted on behalf of the Bureau of Steel Manufacturers of Australia.)
"Foundry Apprentice to Apprentice Foreman," by E. H. Ballard, General Electric Co., West Lynn, Mass.
"Where Are the Young Foundrymen?" by S. W. Utley, Detroit Steel Casting Co., Detroit.
"Carbon and Sulphur in the Cupola—Some Properties of Coke," by J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.
"Correlation of Tests for Cast Iron," by J. G. Pearce, director, British Cast Iron Research association, Birmingham, England. (Presented as the annual exchange paper of the Institute of British Foundrymen.)
"Continuous Core Ovens," by D. B. Hill, Palmer-Bee Co., Detroit.
"Materials Handling," by W. M. Booth, Syracuse, N. Y.
"Reducing Materials Handling Costs in the Jobbing Foundry," by F. C. Campbell, Eastern Corp., New York.
"Induction Furnaces for Ferrous and Nonferrous Metals," by Manuel Tama, Berlin, Germany.
"Value of Analyses and Specifications for Core Oil," by J. A. Gitzen, Lindsay-McMillan Co., Milwaukee.
"A Study of Nonferrous Crucible Melting," by H. E. White, Lava Crucible Co., Pittsburgh.

Student Completes Work in New Course

American Steel Foundries Co., Chicago, which revised its apprentice training course in July, 1927, has awarded a diploma to the first apprentice to be graduated under the new regime. Robert A. Epps, the apprentice so honored, received his diploma at a meeting of the foremen and apprentices of the Granite City, Ill., works of the company. Mr. Epps has been placed in charge of the sand testing laboratory.

BLANKING dies for tin plate work, used by a large fabricator of tin cans. The dies, of a chromium-vanadium steel, are of the double type and were installed in automatic presses making 18,500 can ends per hour. They were found to be good for 3,500,000 end blanks between regrindings and could be reground eight times with one complete reworking between the fifth and sixth periods of use



New Tool and Die Steels Give High Production

Increased Amounts of Chromium, Vanadium, Cobalt and Molybdenum Produce Improved Performance and Longer Life

By Owen K. Parmiter

Metallurgical Engineer, Firth-Sterling Steel Co.

ONE of the types of modern high production steel which has helped to make possible amazing progress in manufacturing methods, mass production and reduced costs is a die steel of the high carbon-high chromium variety. The value of this steel to the electrical and automotive industries is beyond estimate. In dies used for forming, blanking, trimming and extrusion, this new steel has established records which show it to possess about seven times the life and efficiency of carbon steel and at least double that possessed by high-speed steel.

For years, manufacturers of tool steel have been endeavoring to perfect a well-balanced high carbon-high chromium die steel that would machine well. Many compositions have been put upon the market with only a reasonable degree of success in regard to ease in machining. Until several years ago, the most successful of such steels were of the types 1, 2 and 3 in Table I. Several of these steels are satisfactory in many respects but they all lack certain desirable properties, such as ease in machining and filing, which would make them ideal from every viewpoint.

The most recent development in high chromium die steel is a steel in which special consideration has been given to machining properties, at the same time retaining and improving the outstanding features of the type. Its composition is somewhat different from the usual run of these steels and is shown by type 4 in Table I. This chromium-molybdenum-vanadium die steel, widely used in the automotive industry, possesses a number of desirable properties, among which are:

1. Intense hardness without brittleness.
2. Equal degree of hardness from air or oil quenching.
3. Extreme degree of resistance to abrasion.
4. Comparative ease of machining for a high alloy steel.
5. Minimum of dimensional changes and distortion.
6. Deep hardening properties.

Proper forging and heat treating temperatures, and an indication of the

High-Production Steels Make Good Progress

TUNGSTEN carbide has attracted wide attention during the last few years as a new material for cutting tools and dies and its phenomenal success perhaps has overshadowed developments made in high-speed and alloy steels for the same purpose. Nevertheless, some rather remarkable progress has been made in the high-production steel field recently as will be noted in the timely article on the accompanying pages. This article is the second and concluding part of a paper presented before the Columbus, O., chapter of the American Society for Steel Treating, April 8. The first part dealing with tungsten carbide, its manufacture, grinding and applications, appeared on Page 71 of the April 10 issue of IRON TRADE REVIEW. *The author, Owen K. Parmiter, is metallurgical engineer, Firth-Sterling Steel Co., McKeesport, Pa.*

hardness to be expected from these treatments may be outlined as follows:

Operation	Temperature range, degrees Fahr.	Approximate resulting hardness, brinell No.
Forging	1700-1900	....
Annealing	1725-1760	200
Preheating	1200-1300	....
Hardening in air	1800-1875*	650
Hardening in oil	1780-1850*	650
Drawing	300-1000	650-600

*Within this temperature range, the smaller sections should be hardened at the lower end of the range and the larger sections at the upper end.

In addition to its application to dies, this chromium-molybdenum-vanadium steel has given excellent service as plug gages, rolls, lathe centers, bushings and spinning tools. It also possesses considerable merit as a finishing steel, and is particularly valuable in machining nonferrous metals, such as brass and bronze. Table II shows a comparison of chromium-molybdenum die steel and other types of die steel in various forming operations.

Table I

High Carbon-High Chromium Die Steels

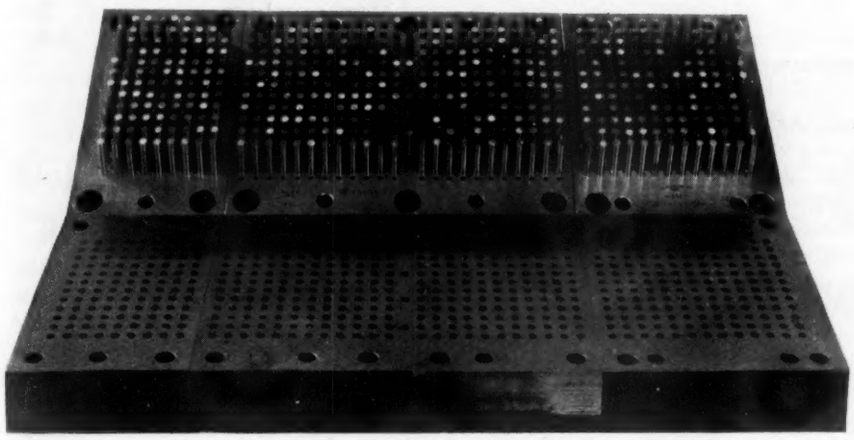
Element	Type 1 Per cent	Type 2 Per cent	Type 3 Per cent	Type 4 Per cent
Carbon	2.25	2.25	1.40	1.40– 1.70
Silicon	0.25	0.20	0.50	0.15– 0.30
Manganese	0.25	0.40	0.25	0.20– 0.40
Chromium	12.50	12.50	12.50	12.00–14.00
Molybdenum	....	....	0.80	0.50– 1.00
Vanadium	0.25	....	....	1.00– 1.50
Cobalt	....	....	3.50	.....
Nickel	....	1.00	....	.....

Table II

Comparative Value of Die Steels

Operation	Chromium-molybdenum-vanadium steel	Competing steel
Drawing ½-inch copper tubing	40,000 feet	19,000 feet (high carbon-chromium steel)
Blanking valve caps	439,000 caps	19,000 caps (high carbon-chromium steel)
Forming dies for battery parts	800 pieces	200 pieces (high-speed steel)
Blanking strap hinges	100,000 hinges	15,000 hinges (carbon steel)

A little over a quarter century ago, Taylor and White conducted their epoch-making experiments and gave to the world the tungsten-chomium alloy steel which is known today as high-speed steel. This development was the beginning of a long series of improvements in steels which were used for cutting metals at high speeds.



Piercing die of chromium-vanadium high-production steel, used to blank, form and emboss small terminal pieces. The die is said to average 975,000 pieces between grinds and is accurate to 0.0005-inch

The next improvement of note was the introduction of vanadium as an additional alloying element in 1906. Vanadium originally was incorporated in an endeavor to purify and toughen the steel. Later, it was found that vanadium not only had a cleansing action but also greatly improved the "red-hardness" properties of the steel. This led to a gradual increase in the percentage of vanadium considered proper for best results. Originally, 0.25 per cent of this element was introduced into high-speed steel. This content was doubled after several years, and later increased to 1.00 per cent. At present, several high-speed steels on the market contain as much as 2.50 per cent vanadium.

Table III traces the changes in composition from the time of Mushet's self-hardening steel through the modern high-speed steel and the so-called super high-speed steel.

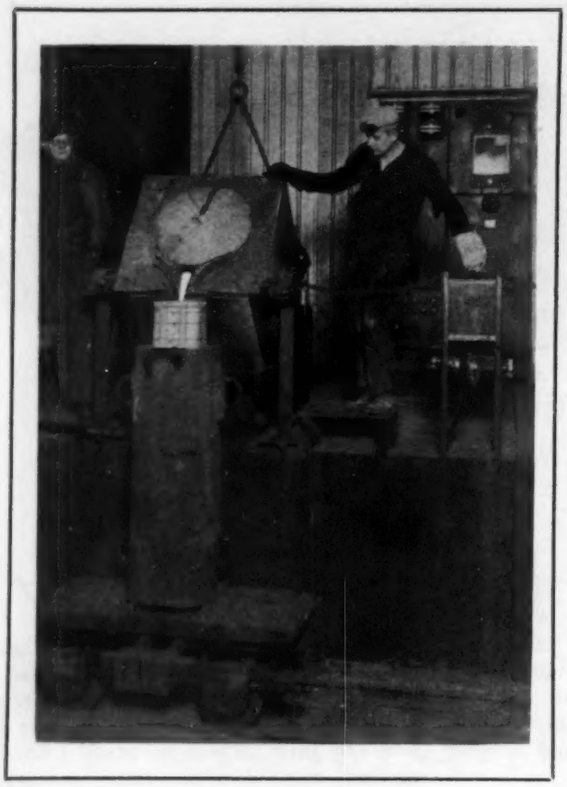
As shown in the table, a marked tendency exists toward increased carbon content in the present-day high-speed steel. The incorporation of additional alloying elements also has played an important part in the modern material.

Until about four years ago, little change had been made in the composition of high-speed steel since before the beginning of the World war. The so-called "18-4-1" composition was considered standard by practically all manufacturers and users. It is true that the carbon content had been increased considerably over that of

Table III

Evolution of High-Speed Steels

Element	Mushet's self-hardening steel —1898 Per cent	Taylor and White —1898 Per cent	Taylor and White —1903 Per cent	High-speed steel —1906 Per cent	Per cent	High-speed steel —1913 Per cent	Per cent	Modern high-speed steel Per cent	Modern super high-speed steel Per cent
Carbon	2.00	1.85	0.65	0.70	0.70	0.75	0.70	0.65–0.80	0.75–0.90
Silicon	1.30	0.15	0.10	0.05	0.20	0.20	0.20	0.20	0.20
Manganese	2.50	0.30	0.15	0.10	0.25	0.25	0.25	0.25	0.25
Tungsten	5.00	8.00	18.00	18.00	18.00	13.50	18.00	17.00–22.00	17.00–22.00
Chromium	0.50	3.80	3.00	5.50	4.50	5.00	4.50	4.00–5.50	4.50– 6.00
Vanadium	0.00	0.00	0.00	0.25	1.00	1.50	1.00	0.75–2.00	1.00– 2.50
Cobalt	....	....	....	....	....	....	4.50	....	8.00–15.00
Molybdenum	....	....	....	....	....	....	....	....	0.75– 1.50



High-frequency electric furnace for melting up special types of high-production steels. Capacity of the furnace is 500 pounds per hour

former years and better methods of melting and handling had improved the product somewhat, but in all this time no radical change in alloy content had taken place.

Early in 1926, the new type of cobalt high-speed steel first was introduced to the industry. This steel carried practically double the cobalt content of the cobalt-bearing steels of former years. Due to the fact that more than 35 per cent of this steel consists of various alloying elements, it soon became apparent that highly efficient melting methods must be practiced if segregation and nonuniformity in the new steel were to be overcome. Accordingly, a scheme was worked out during the introduction of the alloys into the molten bath whereby uniformity is obtained. The high-frequency furnace has played an important part in obtaining uniformity in the steel. Electric heating furnaces, automatically controlled, are necessary to assure a uniform physical condition and structure. Such special practice has done much toward correcting the reputed unreliable nature which, in the past, has been the common fault of all cobalt high-speed steels.

Until the introduction of this new super high-speed steel, considerable prejudice had been held against cobalt steels in general on account of the erratic results obtained through their use. Four years of use have done much to remove doubt as to their value for high production work. Forging and heat treating temperatures for circle C steel, together with resulting hardnesses, are as follows:

Operation	Temperature range, degrees Fahr.	Approximate resulting hardness, brinell No.
Forging	1650-2100	....
Annealing	1600-1700	250
First preheat	1200-1300	....
Second preheat	1700-1800	....
Hardening	2425-2500	650
Drawing	1050-1150	625-675

Welding Society Ready for Spring Meeting

Welding operations required in the fabrication of steel structures and boiler drums will be principal topics of discussion at the annual meeting of the American Welding society at the Engineering Societies building, New York, April 23-25. The program will include five technical sessions, important committee meetings and social events. A symposium will be devoted to the welding of power boiler drums and shells, a tentative code for this welding already having been issued by the boiler code committee of the American Society of Mechanical Engineers for criticism.

Progress in the welding of structural steel will be reported at a meeting of the structural steel welding committee. Papers to be read on the same subject will cover fillet welds, beams welded to columns, stiffness of welded beam construction, panel heating and battle-deck welded floors, welded rotary kilns, the welding of tube turns, the all welded barge, and welding education.

Oil Burner Group Aids Heating Research

Researches in the domestic and industrial heating sciences are developing valuable principles for users of the equipment as well as features in design for the engineer and manufacturer, it was pointed out at the seventh annual convention of the American Oil Burner association at the Stevens hotel, Chicago, April 7-11. Domestic heating equipment predominated at the exposition.

Something of the expansion of the oil burner industry was indicated by the statement of the retiring president, E. M. Fleischmann, Baltimore, pointing out that American home owners bought 130,000 domestic oil burners, representing a total investment of about $100,000,000, during 1929, a year when building operations showed a decrease.

The association, with the American Society of Heating and Ventilating Engineers and Yale university, is conducting a heating research program, and L. E. Seeley, assistant professor of mechanical engineering at Yale Sheffield Scientific school, in charge of the research, reported as to the progress.

Taylor Society To Hold Management Meeting

Management and general administrative problems will be the principal topics of discussion for the annual meeting of the Taylor society to be held at the Deshler-Wallick hotel, Columbus, O., May 1-2. The program, which is as follows, will be devoted to management topics:

Thursday, May 1

MORNING

"General Administrative Organization and Control," by Frederick L. Lamson, assistant to the president, Kendall Co., Boston.

AFTERNOON

"The Major Sales Problems of 1930," by Frank R. Goodell, Anderson, Davis & Hyde Inc., New York.

"Basic Conditions of Effective Utilization of Facilities," by Leslie E. Bryant, Armstrong Cork & Insulation Co., Lancaster, Pa.

EVENING

"The Industrial Relations Problem in 1930 and Its Solution," by Whiting Williams, author and labor relations consultant, Cleveland.

Friday, May 2

MORNING

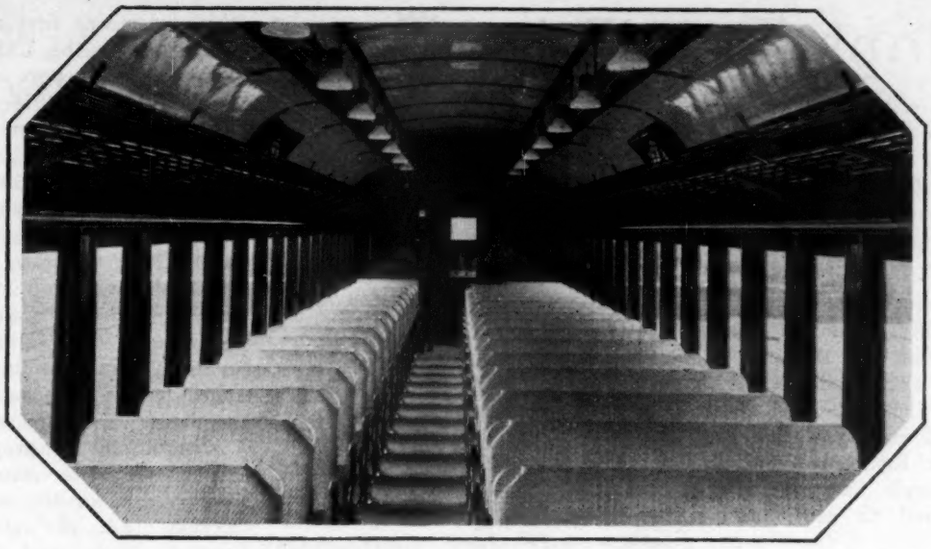
Discussion—"Time and Methods Study."
Discussion—"Managing Hand-to-Mouth Selling."
Discussion—"Functional Organization of Executive Responsibility."

AFTERNOON

Discussion—"Maintenance of Materials and Equipment Standards."
Discussion—"Developing New Items and Channels."
Discussion—"Measuring and Rating Management."

EVENING

"Management Problems of the Next Decade," by David Friday, economist and writer, A. G. Becker & Co., New York.



Racks are made of steel bars and tubes, with malleable iron for brackets

Large Uses of Steel In Small Ways

Luggage Racks

164th Article

THE manufacture of luggage racks for railroad passenger coaches requires annually an average of approximately 100 tons of iron and steel. In the past ten years miscellaneous coach orders averaged 1900 cars annually. Of this number slightly more than one fourth are of the passenger types requiring luggage racks, and it is conservatively estimated that each passenger coach requires 450 pounds. This estimate provides a fair average for coaches with continuous racks, those running from one end of the car to the other, and for those in which racks are set at intervals.

Nonferrous Rack Used First

Luggage racks came into use with the first passenger coaches. For a number of years they were made entirely of brass and bronze, and the design frequently was ornate. It was not until 1909 or 1910 that iron and steel took the ascendency, the transition coming rapidly with the installation of all-steel coaches. It was necessary then to paint the interiors of the cars, instead of using a light varnish or wood stain, and as racks were painted to conform with the general color scheme this led to the use of iron and steel in place of more costly rack materials.

Along with this change came a simplification in the design of racks. Present variations usually pertain to minor details, such as the elimination of coat hooks or of an extra rod often used along the top of the rack to protect the sidewalls of the car from being marred by the luggage.

Racks are made of malleable iron brackets, mild steel bars, steel tubing and stamped parts. In the majority of coaches the racks extend the full length of the interior, in continuous formation. This type of installation came into general use about 1900. The rack is made up in sections, usually about 3 feet long and weighing about 5 pounds per foot. Some sections are 5 and 6 feet long. Rods form the main bed of the rack, running parallel to each other and held in position between two supporting tubes by stamped cross sections of No. 10 gage black sheet steel. The rods of mild steel, usually are 5/16-inch in diameter. The two supporting tubes, on the outer and interior sides, are ⅝-inch in diameter and enclose a 7/16-inch cold rolled steel rod for rigidity and strength.

Practically all sections are provided with means for fitting end knobs, for installation as individual units if desired. For this purpose units longer than 3 feet are specified and an extra bracket usually is used for support. Racks usually range from 11½ to 14⅝ inches in width.

Racks Thought of By Miles

Due to the longitudinal characteristics of baggage racks, orders sometimes are thought of in terms of miles, an order for 50 passenger coaches for instance requiring about one mile of racking.

In the past few years the increasing use of busses in interurban service has been a factor in limiting the number of passenger coaches purchased, although more railroad coaches probably were bought last year than in the three years or so preceding. Some railroads have eliminated racks in coaches for surburban traffic using the space for advertising panels. Luggage racks installed in busses are taking a relatively moderate amount of steel. These racks differ in design, being constructed largely of solid sheet metal.

THIS is the one hundred sixty-fourth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the American tonnage.

Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Belt Fasteners	*Washing Machines*
Sap Spouts	*Resilient Road Guards*
Flexible Conductors	*Screw Drivers*
Foundry Flasks	*Car and Bus Seats*
Teletype Machines	*Bathroom Cabinets*
Porch Furniture	*Lock Washers*
Telegraph Wire	*Steel Scaffolding*
Waste Receptacles	*Pavement Armor*
Chain Screens	*Torches*
Louvred Ventilators	*Ironing Machines*
Universal Joints	*Ball Bearings*
Rolling Doors	*Telephone Booths*
Messenger Call Boxes	*Springs*
Foot Guards	*Automobile Lamps*
Furniture Glides	*Power Lawn Mowers*

Develops True Price Trend for Track Angle Bars

By William E. Oberle

TRUE price trends for rails, spikes, bolts, and tie plates were delineated in the June 13, Oct. 17, Dec. 5, 1929, and March 13, 1930, issues of IRON TRADE REVIEW, respectively, and now the same sort of a trend has been developed for railroad track angle bars which are commonly referred to as joints or splices.

Statistics on which these trends are based have been taken from *War Industries Board Price Bulletin No.* 33, Bernard M. Baruch, chairman, Edwin F. Gay, chairman of the division of planning and statistics; *History of Prices During the War*, Wesley C. Mitchell, editor-in-chief; and *Prices of Iron, Steel and Their Products*, by Walter W. Stewart. Dr. Stewart later became director of the division of research and statistics, federal reserve board. The other two, Professors Gay and Mitchell, and Dr. Stewart are among the foremost technical economists and are associated with either the American Economic association or the American Statistical association.

The sources from which these experts drew data for their report to the war industries or war trade board included: IRON TRADE REVIEW; *Metal Statistics; American Metal Market; Iron Age; Steel and Metal Digest;* reports of the commissioner of corporations on *The Steel Industry*, American Iron and Steel institute; summary of the bureau of foreign and domestic commerce, and *The Census of Manufacturers.*

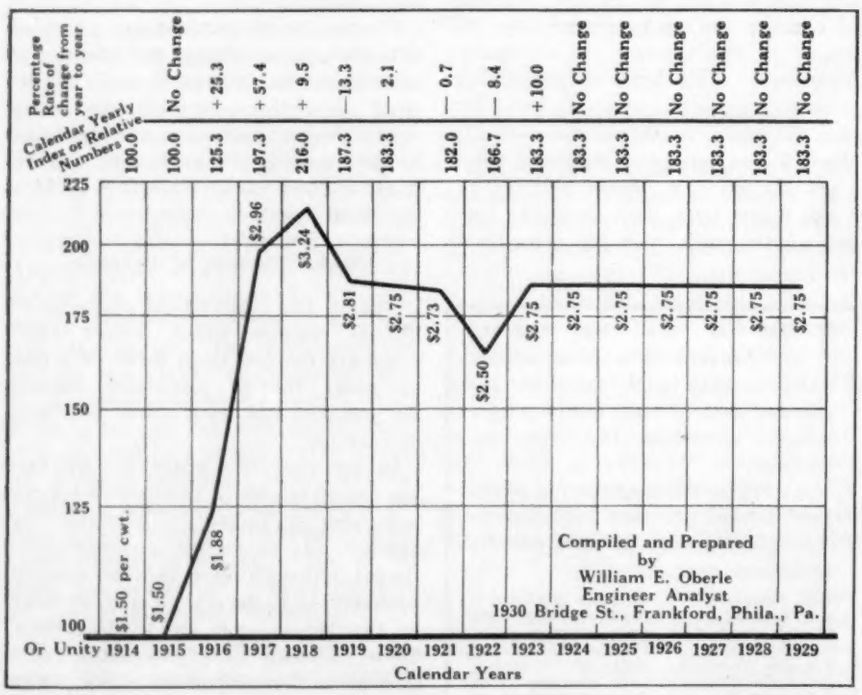
Studies Corroborate Results

As a check or corroboration, the writer drew upon studies and analyses upon which he has been engaged since 1916. These consisted of the returns made by the steam carriers to Valuation Order No. 14, promulgated by the interstate commerce commission and requiring the reporting of purchases and prices paid for many kinds of materials used by the railroads in operation and maintenance. When this order was first issued, all Class I carriers in the United States were required to report for the period 1905 or 1910 to 1915, inclusive. Later, upon modification, only specified Class I carriers were required to file reports. In the early part of 1916 this sort of data was assembled, tabulated and cost summaries compiled. The same thing also was done for certain selected items of material in the period 1916 to the first half of 1920. Using all this authoritative source material, and keeping in mind continually the technical principles and methods of economic and statistical presentation for proper or true results, the writer was able to weave the stories for the early part of the period. For the latter part of the period, trade and business papers were referred to, and these in turn were reinforced and verified by observation, study, and analysis of the purchase experience of a 27,000-track mile steam carrier with which the writer is now connected.

Principles and Methods of Accounting Practice Lack Economic or Statistical Usefulness—As mentioned in the tie plate study, and experienced in all of these efforts, one of the major difficulties in cost analysis for trending purposes is to differentiate between costs or prices paid when the order or contract was placed and those paid on the subsequent delivery or shipping date. Particularly is this true in time of great price change, such as was experienced within the period covered in this and other studies and analyses involving the scanning of accounting costs. These costs invariably reflect the prices when the bill was paid without any regard whatsoever to harmony with the economic or statistical price level existing when the material was originally ordered. For this reason alone, the purchasing power of money and its ability to express the true rate of increase or decrease in the cost of an article or item never can be properly undertaken from the prevailing accounting practice of recording costs. And for the same reason, it is impossible for the accountant to account for value as well as cost from his recording.

Dollar Costs Inaccurate

In other words, his original cost, as of any time or period, is a measure of so many inflexible dollar units of 100 cents each expended, each such unit comprising a medley of goods units at shifting price levels, sometimes obtaining one, and at another time two or only half of one unit for the dollar expenditure. Nevertheless, all the dollars are added to-



Semilogarithmic chart showing true trend of prices of a rolled carbon steel railroad track angle bar, joint or splice, bessemer or open-hearth processed, not heat or oil treated, expressed by yearly index of relative numbers based upon the price of 1914 *equaling* 100 *or unity, together with the percentage rate of change from year to year*

NOTE: For special extra costs such as content, hot working, annealing, oil quenching, etc., see text.

gether as are the goods units, the latter without any attempt whatsoever to equate for the variance in purchasing power of obtaining one, two or only half of one, and we have dollar cost of the goods units, but it can serve no other purpose than that of a bookkeeping fiigure.

The accompanying semilogarithmic chart portrays the true rate of change for each calendar year from 1914 forward in the price of a rolled carbon steel angle bar, joint or splice, bessemer or open-hearth processed, for standard section "T" rails. Each yearly price is an arithmetic average of 52 weekly quotations, f.o.b. mills, either the Chicago or Pittsburgh center. As formerly stated in the other studies, all data on the chart are prices or costs only, and are not in any way alligated by the quantities produced. For this reason, comparison is strictly true between the years or period covered because no distortion is introduced through varying specifications of purchases being reflected in quantities sold by the mills. Further, no bids in the prices named are reflected by reason of extra cost caused by some specifications.

Extra Costs Listed

The Feature of Extra Costs—In the early part of the period, medium instead of low carbon contents cost 5 cents more per hundredweight; high instead of low carbon cost 15 cents more per hundredweight; extra high in the open-hearth process cost 15 cents more per hundredweight; hot-working cost 10 cents more per hundredweight; annealing cost 15 cents more per hundredweight and oil quenching cost 20 cents more per hundredweight. The last three in addition to the extras for quality. Extras for special analysis ran as follows:

	Cents per hundredweight
For sulphur specified in bessemer steel 0.075 or higher	5
For sulphur specified in open-hearth steel 0.06 maximum	5
For sulphur specified in open-hearth steel 0.05 maximum	10
For phosphorus specified in open-hearth steel 0.03 maximum	4½

None of these extra costs nor those on the chart apply to patented or compromise joints or splices. These special joints or splices will be made the subject of another study.

Today, oil treatment costs 40 cents more per hundredweight in addition to the prices on the chart and this cost has not changed since about 1923.

The semilogarithmic field, known as the "arithlog" or "ratio" chart, *is used in charting the trends* because it is a technical device employed to present graphically the slope of the curve, line or trend without having to keep in mind the magnitudes on the vertical scale. In other words, equal percentage rates of change, show the same degree of inclination or declination, something that the ordinary arithmetic scaled chart utterly fails to do in its attempted picturization.

Completes 1100-Ton Stack in Record Time

A record for rebuilding a blast furnace is believed to have been set in the construction work recently completed on No. 1 furnace of the Weirton Steel Co., Weirton, W. Va., division of the National Steel Corp. This stack was blown in April 2, following a shutdown of 91½ days, and on the ninth day after it was lighted produced 1105 tons, compared with its former nominal capacity of 600 tons daily. General engineering and design work of this project was handled by the engineering department of the Weirton Steel Co. and the contract for the construction of the furnace and a new cast house was placed with the McClintic-Marshall Co.

The new furnace has a hearth diameter of 25½ feet, a bosh diameter of 29 feet, a stockline diameter of 19 feet 4 inches; a large bell of 14 feet 2 inches diameter; and is 91½ feet from the center line of the iron notch to the top ring.

The furnace is supported on 16 cast-iron columns and is blown with 16 tuyeres. There are four uptake and downcomer branches joining into two main downcomers connecting with the existing gas cleaning system. Iron and steel work in the furnace proper amounted to 950 tons and 140 tons of structural steel work was used in the skip structure and cast house. The lining of the furnace required 820,000 nine-inch equivalent brick and 400,00 bricks for the relining of No. 3 stove.

Interest High at Third Annual Air Show

Record attendance and interest shown in the third annual All-American Aircraft Show, held in Detroit, April 5-13, demonstrated more forcibly than ever the increasing popularity being accorded to aviation everywhere. The show was contained in the new $1,000,000 hangar recently erected on the city airport and comprised over 80 planes and gliders in addition to approximately 50 more ships stationed in the adjoining 250-acre airport. Within the building were some 125 booths displaying a wide range of parts and accessories for aircraft.

Attendance outstripped all former marks by a wide margin, 14,300 attending the first day and unofficial estimates placing attendance for the entire show at better than 80,000.

The exhibition featured the first public display of the new Packard diesel aircraft engine which attracted the major share of attention. Several planes on exhibition were equipped with this new power plant while a number of craft on the field were equipped likewise and held in readiness for demonstration flights. The airplane division of the Ford Motor Co. arranged an extensive display, showing in miniature the topography of the Ford airport, in addition to several tri-motored planes open for close inspection. All leading manufacturers of aircraft and aircraft equipment operated booths at the show, the total indoor floor space being 205,000 square feet. Appropriate dedicatory ceremonies opened the show, officials from Detroit and Michigan taking an active part.

Coincident with the aircraft show was a three-day aeronautic meeting of the Society of Automotive Engineers at the Book-Cadillac hotel. Papers on a variety of technical subjects pertaining to aircraft were read and discussed, and trips were arranged to the airports where unusual demonstrations were performed for visiting air enthusiasts.

Illinois Students Given Awards for Design

The three cash prizes for 1930 offered by the American Institute of Steel Construction for the most beautiful design of a steel bridge submitted by architectural students were won by students of the University of Illinois, Urbana, Ill. These prizes, amounting to $500, $250, and $100 respectively, were made through the Beaux-Arts Institute of Design. A total of 160 students enrolled in the competition and submitted sketches in the preliminary judgment. The problem called for a design of a steel bridge of 650 feet total length and with a main arch span of 325 feet. This year's prizes were the second annual awards. The prizes were awarded at the final judgment to George D. Recher, first; Russel O. Deeter, second; and Don P. Ayres, third, all of the University of Illinois.

Baldwin Locomotive Works had unfilled orders April 1 amounting to $22,137,000 compared with $16,689,000 April 1, 1929.

American tractors on Soviet state farm. These machines are driven by women as well as men

Will America Lose Its Implement Market in Russia?

Heavy Purchases of Tractors and Farm Equipment Are Mostly from United States—Russian Buyer Tells of Plans for Home Manufacture

By A. M. Roze

President, Russian Agricultural Machinery Importing Organization

ONE of the chief bases for the modernization of Soviet agriculture is development of the agricultural machinery industry. Machine technic and scientific cultivation of the land will make possible rapid development of productive forces with which success of the movement for socialization of agriculture, the extension of state and co-operative farming, is bound up. For this reason development of the farm machinery industry has been made one of the principal planks in the industrial program laid out by the Soviet government. Production of agricultural machinery in 1928-29 was three times that of the last prewar year, while the program for the current year provides for an increase of 76 per cent over last year. At the same time, demand for imported equipment by the state and collective farms has resulted in the U. S. S. R. becoming one of the largest markets for imported agricultural machinery and, in particular, the third largest market for American agricultural machinery.

Utilization of farm machinery and implements in Russia before the revolution was greatest, in regard both to quantity and variety, in the grain-producing regions. In other regions primitive implements, such as the "sokha" (wooden plow), wooden harrow, scythe and flail, dominated. The principal users of agricultural machinery were the large farms of the landlords and wealthy peasants. It was from these farms that most of the marketable agricultural surplus came.

The value of the output of agricultural machinery in the present territory of Russia in prewar years was about 70,000,000 rubles, at present day prices. The principal machines produced were threshers, which made up 24 per cent of the total in value, cultivators 21 per cent, grain harvesting machinery 18 per cent, and drills 12 per cent. The remainder consisted of engines, seed cleaning and grading machinery, hay machinery, feed and fodder grinders. It is estimated that 40,000 to 45,000 workers were then employed in the industry.

Domestic production was quite insufficient to supply the demand, necessitating large imports. The Soviet

Is Russia To Supplant American Implements?

WITH Soviet Russia third best customer for American agricultural implements and the United States furnishing about half of the present Russian imports of that class of machinery a large tonnage of American steel and iron is going into this outlet. With the Soviet government developing its own plants for the manufacture of these implements what is the future of American producers now applying much of their effort to filling the needs of this great agricultural region? In the accompanying article from the president of the agricultural machinery importing organization a glimpse is given of what Russia is doing to provide its own sources of supply. Whether sufficient mechanical and business ability will be found to operate the new plants in competition with American producers is worth the thought of American builders.

customs statistics show the following imports of agricultural machinery before the war:

	Quantity (in metric tons)	Value (in rubles*)
1911	170,000	57,875,000
1912	195,000	63,545,000
1913	146,000	51,113,000

*Ruble, 51.5 cents.

In 1913 harvesting machinery, amounting to 14,823,000 rubles, made up 29 per cent of the imports. Engine imports were valued at 7,625,000 rubles, threshers at 6,516,000 rubles, plows, harrows and cultivators at 5,747,000 and drills at 3,469,000 rubles.

The average annual imports of agricultural machinery into Russia during the five-year period 1909-1913 were distributed as follows, by countries:

	Quantity (in metric tons)	Value (in rubles)
Germany	53,300	16,797,000
United States	50,500	15,900,000
England	23,700	9,512,000
Austria-Hungary	10,300	4,219,000
Sweden	5,400	2,591,000
Other countries	5,000	2,033,000
Total	148,200	51,052,000

Germany, as may be seen from this table, was first, accounting for 33 per cent of the total. The United States followed closely with 31 per cent, England supplied 17, Austria-Hungary over 8, Sweden 5, and all others 4 per cent.

Purchases in the past fiscal year in the United States were more than double those of the preceding year.

In the past half-year 20,125 American tractors, valued at over $30,000,000 were purchased and are being shipped to the Soviet Union. The Amtorg Trading Corp., which represents the Soviet importing organization, also bought 17,000 plows, 2000 grain drills for seeding machines, and 18,000 special drills for cotton and corn. This machinery will be used in the spring sowing campaign this year. Some of the purchases, in which International Harvester Co., Caterpillar Tractor Co., Deere & Co., Massey-Harris Harvester Co., Cleveland Tractor Co., J. I. Case Threshing Machine Co., Allis-Chalmers Mfg. Co., Oliver Chilled Plow Works, B. F. Avery & Sons, etc., participated, involved credits up to three years.

Russia is using American power units in its agricultural work

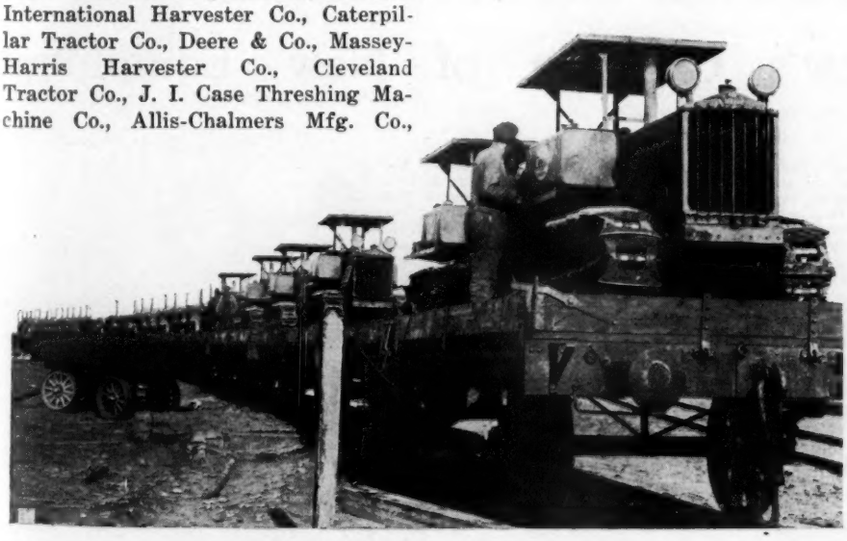
United States Is Leader

The United States now is the undisputed leader in imports of agricultural machinery and implements into the U. S. S. R., accounting, with Canada, for almost half the total imports in the last few years. This is due to the tendency to increase imports of tractors and tractor-drawn implements. The second place was occupied by Germany with more than 25 per cent and third by Austria, the latter as a result of large sales of seed-grading machinery during the past few years.

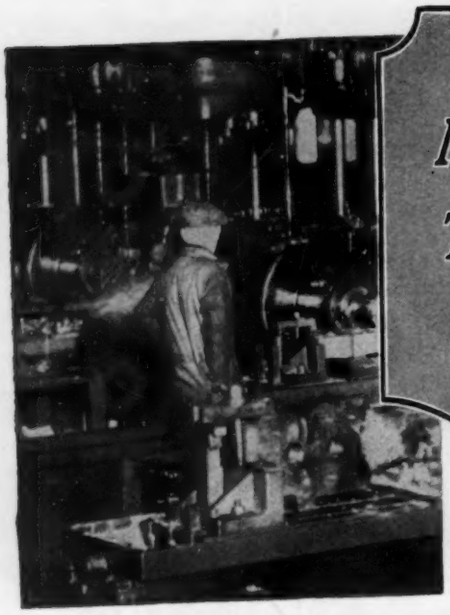
Detailed figures for the various categories of agricultural machinery, implements and tractors imported in 1928-29 are not yet available, but the total value of imports during that year was much greater than in either of the two previous years, amounting, for machinery and tractors together, to 43,478,000 rubles ($22,400,000), compared with 23,288,000 rubles in 1927-28 and 24,350,000 rubles in 1926-27. The rapid development of this branch of imports, especially from the United States, is shown by the fact that the orders placed in that country alone during 1928-29 for tractors and agricultural machinery amounted to $27,267,629, which is more than the actual imports from all countries during the same year.

The five-year plan for economic development of the U. S. S. R. necessitates a fundamental reorganization of agriculture involving deep-going changes in the forms of land cultivation, the organization of collective and state farms of an unprecedented size and highly mechanized. During the five years it will be necessary to supply agriculture with machinery, implements and tractors to the sum of 5,000,000,000 rubles, of which the sales in 1932-33, the last year of the period, are expected to exceed 2,000,000,000 rubles.

The problem of tractor production is being met by construction of new factories at Stalingrad, Cheliabinsk and Kharkov and by increasing capacity of the tractor division of the Putilov plant. The Stalingrad tractor plant will start production in 1930 and will have an output of 25,000 units in 1931-32 and 50,000 by 1932-33. The Cheliabinsk plant will have a similar output. The Southern (Kharkov) tractor plant will produce 50,000 30-horsepower tractors annually by 1932-33. The expansion of the tractor division of the Putilov works in Leningrad will result in an output of 20,000 tractors a year by the end of the five-year period.



Moving American tractors to another Soviet farm



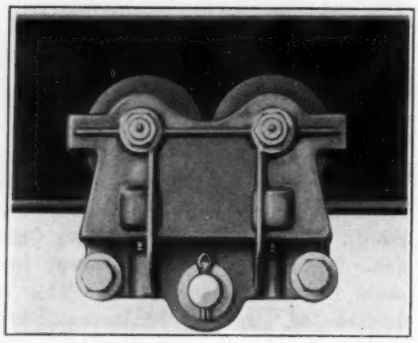
New Machine Tools and Shop Equipment

"Magnified and shaped in steel, here is the final energy, the seed that fertilizes space."
—MacKnight Black

Trolley Built To Resist Severe Overloads

ITP No. 109

Robbins & Myers Inc., Springfield, O., is announcing a new trolley in plain and geared types ranging from ½ to 20-ton capacity. The trolley, shown in the accompanying illustration, is of heavy ribbed cast steel frame, capable of taking severe overload without destruction. It is equipped with chilled and crowned wheels of the same analysis metal as standard chilled iron railroad car wheels. Uniformity is insured by annealing. The arrangement of 12 roller bearings not only provides for all radial and thrust loads, but also eliminates guide roller friction when the trolley is used on monorail beams. All bearings are dustproof while vertical guide rollers bear against the edge of I-beam flanges on curves, permitting use of the trolley on small radius curves. Smaller sizes of the trolley are adjustable to seven I-beam sizes, while the crowned wheel design permits trolley operation on special beams within standard flange limits.



No. 109—Trolley has heavy ribbed cast-steel frame to provide strength

Reversing Switch Built for Stronger Motors

ITP No. 110

General Electric Co. Schenectady, N. Y., has designed a new enclosed magnetic reversing switch which has the ability to control motors of greater horsepower than those controlled by the superseded type of switch formerly built by the company. The new device is designed to throw small alternating-current motors directly across the line. It consists of two triple-pole, mechanically interlocked, magnetically operated contactors with restricted-type blowouts, and with a normally-open interlock in each contactor. It also has two hand-reset temperature overload relays. The contactors are mounted side by side on a molded base, instead of back to back as in the previous design. The de-

Iron Trade Review's Calendar of New Equipment

Item	Comment	Builder	No.	Date described	Page
Timing device	Automatically controls electrohydraulic press	Terkelson Machine Co.	92	April 3	87
Surface grinder	Grinds both flat and vertical surfaces	Berea Machine & Tool Works	93	April 3	87
Die spotter	Operates on shop air supply; high accuracy	Marquette Tool & Mfg. Co.	94	April 3	87
Grinder attachment	Simplifies sharpening of face mills	Cincinnati Milling Machine Co.	95	April 3	88
Bending machine	For structural shapes; riveted and welded	Thomas Spacing Machine Co.	96	April 3	88
Tool housing	Electric tools provided with stronger housings	United States Electrical Tool Co.	97	April 3	88
Centrifugal accelerator	Hydromatic starter provides more uniform starting	Worcester Polytechnic institute	98	April 3	88
Pump	Two-stage, vertical type; no packing used	Ruthman Machinery Co.	99	April 3	89
Upsetting machine	Unusually large; has twin flywheels and twin gearing	Ajax Mfg. Co.	100	April 3	89
Electrode holder	Ventilated handle; has new clamping mechanism	Northwestern Mfg. Co.	101	April 10	80
Drive chain	For heavy-duty applications; made of alloy steel	Link-Belt Co.	102	April 10	80
Master switch	For use with magnetic contactor controller	Electric Controller & Mfg. Co.	103	April 10	81
Boiler water meter	Provides certain indication of water concentration	Elgin Softener Corp.	104	April 10	81
Circuit breaker	Trip-free from handle on overcurrent	General Electric Co.	105	April 10	81
Vacuum cleaner	Portable type for cleaning machinery, motors, etc.	Breuer Electric Mfg. Co.	106	April 10	81
Tractor shovel	¾-yard shovel capacity; full swing operation	Detroit Power Shovel Co.	107	April 10	81
Frequency converter	Provides special frequencies; operates on local power	Reliance Electric & Engineering Co.	108	April 10	82
Trolley	Adaptable to many sizes of beams; reduces friction	Robbins & Myers Inc.	109	April 17	60
Reversing switch	Designed to control large motors; has magnetic action		110	April 17	60
Grease pump	Built to handle mill greases; operates in oil bath	Hills-McCanna Co.	111	April 17	61
Boiler plug wrenches	Alloy steel handle sets provided for convenience		112	April 17	61
Drilling machines	Action is semiautomatic; drills and reams at rapid rate	Langelier Mfg. Co.	113	April 17	61

vice is contained in a drawn-shell steel enclosing case. The switch is available for all types of installation using from 110 to 600 volts, and will develop from 3 to 15 horsepower.

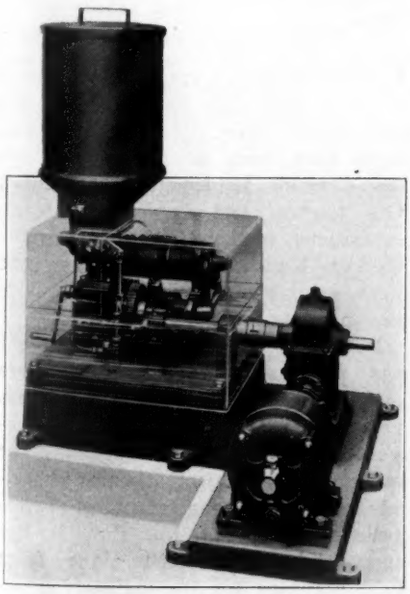
Rugged Machine Pumps Heavy Mill Greases

No. 111

Hills-McCanna Co., Chicago, has designed a grease pump offering a fully mechanical means for pumping heavy mill greases. The pump, shown in the accompanying illustration, was developed to care for the trend in present day equipment lubrication toward heavier and more viscous materials. It is a device of simple and rugged construction capable of withstanding unusual pressures. It involves no dependence on air, hydraulic or spring pressures. It is positive, delivering measured quantities of lubricant to the surface to provide a thorough protective film.

The grease is introduced into the feeding system of the grease pump by means of a displacement pump operating a positive mechanical valve opened on the suction stroke, and closed prior to the discharge stroke. A distributor head with the requisite number of leads is connected directly to the discharge side of the pump. The indexing of the head is secured by means of a ratchet attachment which allows indexing on the suction stroke of the pump and remains fixed during the discharge stroke, after which it indexes to the next lead and continues in order.

Delivery lines are attached directly to the distributor head and lead to the connections of the equipment bearings. A steam heating element is installed on the bottom of the hopper casting directly above the intake valve, to facilitate handling of heavy grease during cold weather. A screen is located in the grease hopper bottom beneath the steam heating element and above the intake valve to prevent foreign matter from entering the pump. Provision also is made for adjustment of the stroke of the pump to regulate the amount of grease delivery. All running parts are enclosed and the entire mechanism operates in a grease or oil bath. The unit is built in various sizes with from 4 up to 24 feed lines per minute.



No. 111—Grease pump designed to meet the need for pumping heavy mill greases

No. 112—Wrench for boiler plugs can be adjusted to clear obstruction

Wrenches Easily Reach All Boiler Plugs

No. 112

Stevens Walden Inc., Worcester, Mass., is announcing a new powerful, balanced wrench set for fast, safe work with handle combinations that will reach every plug on a locomotive boiler and turn it with comparative ease. The wrench, shown in the accompanying illustration, is equipped with three chrome alloy steel, heavy duty, double-square sockets provided in 1¼, 1½ and 2-inch sizes to fit all washout plugs in common use. The advantage of the socket is that it will not cut the plugs.

Fits in Eight Positions

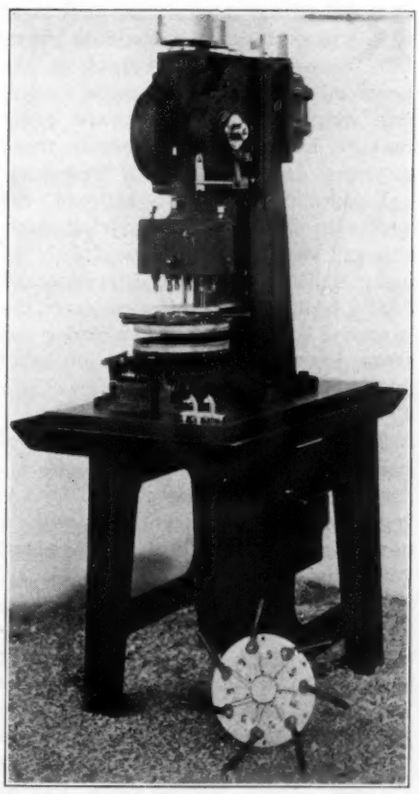
The double-square feature is a double broaching of the sockets so that they will fit over the plug in eight positions instead of four. The operator can take a new hold on the plug every 45 degree turn. This is an advantage in close quarters and enables the operator to remove or replace the plug without changing his position.

Machine Drills, Reams 20 Holes Per Minute

No. 113

Langelier Mfg. Co., Providence, R. I., has developed a semiautomatic upright drilling machine for drilling and reaming two ⅛-inch holes spaced ⅜-inch apart in two types of die-forged brass ball float levers. The output for each type is ten completely drilled and reamed levers per minute. The automatic drilling unit is equipped with a drilling and reaming head of eight spindles, four spindles for each type of lever, while the eight spindle drilling and reaming head is used in conjunction with a seven-station automatically-operated indexing dial.

This dial is operated by a face cam on the drilling unit which is connected through levers and connecting rod to a pawl and ratchet wheel on the indexing fixture. A positive lock also is provided for accurately locating and holding the dial in position. The indexing fixture has two separate interchangeable dial places, one for each type of ball float lever. Each dial plate is fitted with seven hand clamping levers, V blocks and stop blocks for locating and holding the float levers. A stationary drill guide plate is used for accurately starting the drills. The machine is shown in the accompanying illustration.



No. 113—High-speed upright drill has multiple spindles

Steel Angles from Chicago

Railroads, Farm Implements Give Vigor to Steel

Now Trade Used Tank Cars—Irish Tractors Annoy

CHICAGO, April 15

RAILROAD and farm implement steel remain a tonic to western open-hearth output as the usual miscellaneous consumers, including automotive and aircraft parts makers, have shown no definite trend or have developed mixed tendencies.

Prospects of further railroad car orders to dovetail with expiring western car shop schedules about July 15 are brighter, due to the promise of 35,000 to 40,000 tons of steel from the proposed Illinois Central order of more than 2300 cars, and probably 50,000 tons or more for New York Central car building.

Secondary optional releases for steel rails cannot be expected in volume before 60 days. Quarterly track fastenings programs will continue, with a sprinkling of spot orders of about 2500 tons weekly.

* * *

MORE than 135,000 tons of railroad track accessories, including tie plates, bolts, spikes and angle bars, have been awarded in the Chicago district since the first week in January. Standard steel rail orders the past three months have totaled nearly 75,000 tons, putting more than 1,000,000 tons on the books of the two local rail mills for 1930, but active primary buying for the year's track laying is over.

Virtually all of the some 250 foundries in the district have been favored with railroad work at intervals, which helped to balance casting schedules. Finished steel for implement and tractor accounts totals more than 200,000 tons.

* * *

WITH the season's first open weather, a phalanx of horse and motor-drawn farm implements, increasingly power driven this year, has turned out on western prairies, as implement works have finished shipment on a heavy run of seasonal power and hand tillage tools. Many implement plants already are on harvesting and threshing machinery schedules, and the switch-over is being accomplished with little loss of time. The weather speeded up seasonal demand about 30 days.

The harvesting machinery outlook is much improved because of the recent upturn in wheat prices. While operations on harvesting schedules alone are somewhat spotty, several units, ordinarily experiencing a poor first quarter on their particular production, now report an unusual volume of business for that period. Battle Creek, Mich., unit of the Oliver Farm Implement Co. in the past few weeks has sent out six implement special trains, largely combine-thresher equipment, to Omaha and other western points for distribution. All five manufacturing units of this company are busy.

* * *

SHIPMENTS of spring tillage tools have held their own with the last two record years. About 400 trainloads have been shipped West from the Chicago implement area alone. The tractor and implement spring expositions were well attended. The Wichita, Kans., show had 50 per cent more exhibitors this year, and sales amounted to about $2,000,000.

Nevertheless the larger implement and farm equipment manufacturers are laying aside vast sums for research into fields of further refinement in farm mechanization. The tractor is the subject of much experimentation. Announcement of International Harvester Co. that it has appropriated $2,000,000 alone from 1929 earnings for its engineering research departments, in addition to previous years' expenditures to carry on the work, is followed by similar

manifestoes from others. Modine Mfg. Co., Racine, Wis., manufacturer of radiators for farm tractors, trucks and automobiles, has adopted the policy of continually expanding facilities for research and experimental work.

* * *

SEVERAL western states likewise are interested. The Montana Agricultural Experiment station is using a large farming area to experiment on power farming, and is on a quest for solutions to such practical problems as types of equipment and investment in relation to acreage, the most economical combination of land and power, and the scheduling of farm work and crops to obtain maximum usefulness from power equipment. Experimental grounds are becoming as essential for power farming as its proving grounds are to automobile manufacturers, a state engineer points out.

Kaleidoscopic changes are taking place in the use of implements. The result is startling to the users. A leading farm research engineer points out that the transformation in the adaptation of farm machinery in the last five years have been more marked than in the 70 years following covered wagon days. Predictions are that present research will lead much farther.

* * *

IRISH-MADE tractors imported to this country by Ford are creating some discomfiture among tractor builders, particularly since the output and shipments have been growing. Some views are that the shipments from Ford's plant in Cork, coming to the United States duty free, contributed to the recent cut in tractor prices for several models by International Harvester and Deere & Co. It is pointed out on the other hand that the continuous production and assembly lines in the tractor plants, with consequent paring of overhead, has helped make possible production and marketing methods for tractors similar to automobiles.

Ford now makes his tractors exclusively in Ireland, using foreign labor and to some extent foreign materials, and moves his product to the American market under paragraph 1604 of the tariff act free list. During January, 1365 tractors were shipped from the Ford plant at Cork to New York, it is stated, and in February the number grew to 2505. Tractor parts increased from 160 tons in January to 427 tons in February.

* * *

ONE of the Ford officials, at tariff hearings in Washington last summer, told the senate finance committee that the company had shut down its tractor plant in Detroit and moved to Ireland because it was handicapped for space when the new Ford automobile was brought out. Ireland was the logical place to go, he said, because the company has had a tractor plant there since 1917, established during the war, but importation of Irish-made tractors in competition with this country's domestic business did not start until 1929. This official also expressed the view that the manufacturing cost in Cork would prove higher than in Detroit, but his view at that time was the subject of further query.

Thus tractor shipments are moving export and import, as a number of the tractor manufacturers in the Chicago district have been enjoying a brisk foreign trade this spring. J. I. Case Threshing Machine Co., Racine, Wis., recently worked off Russian and other foreign tractor orders, and Caterpillar Tractor Co., Peoria, Ill., has just completed an order from the Soviet government for larger size tractors for agricultural use, totaling more than $5,500,000.

* * *

BROADENING uses for tank cars are being reflected in earnings of the tank car building and leasing companies to a greater extent than heretofore. The uses to which tank cars are put have become bewildering. Gasoline is being shipped in greater volume from the Southwestern oil country to Illinois, Iowa, Missouri and points in the Northwest, a number of relatively small towns obtaining their gasoline supplies in this way.

Tank car building has boomed within the past year as many of the lessees and owners have been trading in used tank cars for new ones. This has been due in part to the desire for more sturdily built cars, particularly for transporting sulphuric acid and other chemicals and liquids for steelworks pickling and similar industrial uses.

* * *

NEWER class I tank cars are being built with an extra brace in the center to prevent the tank from rupturing. Some of the existing tank cars have been regarded as obsolete for that reason. Sulphuric acid and other liquids for steelworks pickling is being shipped in a minimum of 60 per cent concentrated form in tank cars without lining.

Tank car operations are being extended widely to foreign fields. General American Tank Car Corp. expects its first half earnings to be augmented by its new foreign subsidiary, the Societe de Moyans de Transport, which it organized in Switzerland the first of the year, with an initial capital of 8,250,000 Swiss francs. Negotiations for the acquisition of several companies by General American are reported to be progressing, and the company recently increased its capital stock. Earnings reports for the company's 1929 operations show a gain in net of about 40 per cent over the preceding year, and first half estimates for this year indicate a substantial gain over 1929.

* * *

TANK CAR STATIONS INC., a New York corporation, has entered the Chicago district with a plan for establishing a number of automobile filling stations in the city at which petroleum products will be received direct from tank cars. The plan requires the location of these stations adjacent to railroad tracks.

A large Chicago scrap iron and steel and railway track supply dealer has embarked successfully upon the operation of a fleet of tank cars of the class 2 type, servicing and leasing the cars to petroleum products, molasses and vegetable oil shippers. This company does not contemplate competing with the large tank car companies, but is offering its services to the shipper whose needs can be filled advantageously through the use of the lighter and cheaper tank cars. Service and maintenance stations for these cars have been located in the Chicago district and several of the larger cities, particularly in the West. Eventually, it appears that the fleet of tank cars built recently for that company must be augmented by new cars, and thus a dealer in iron and steel scrap becomes a potential railroad car buyer.

* * *

SUPPLY and demand have tended to quiet an imminent spring uprising for more pay among the 110,000 union building trades mechanics in the metropolitan Chicago area. Building contractors are said to be receiving applications of building mechanics willing to work at $1 and $1.25 an hour, with the average basic wage 1.62½ an hour. Bricklayers, electricians, lathers, plasterers, steamfitters and plumbers get $1.70 an hour, according to existing wage scales. The heralded demands for more union pay were nipped in the bud by the surplus of labor seeking employment as the result of the most quiet building conditions in the district for nine years.

Labor costs are said to constitute 60 per cent of actual construction figures in the district. The Bridge and Structural Iron Workers' union is seeking an increase from $1.62½ an hour to $1.75, but the fact that 500 of the union's 2400 members are unemployed may end the negotiations.

British Steel Institute Ready for Meeting

Eugene Schneider and Dr. Walter Rosenhain each will receive Bessemer gold medals at the annual meeting of the British Iron and Steel institute in London, May 1-2. The first day will be devoted to business sessions and the second to technical sessions. Prof. Henry Louis, serving his second year as president, will direct the proceedings. W. E. Simons, Cardiff, Wales, will be awarded the Williams prize. Papers to be read at the technical sessions are as follows:

"Some Alloys for Use at High Temperatures. Nickel-Chromium and Complex Iron-Nickel-Chromium Alloys." Part I, by W. Rosenhain and C. H. M. Jenkins. Part II by C. H. M. Jenkins, H. J. Tapsell, C. R. Austin and W. P. Rees.

"Developments in Fuel Economy at Skinningrove," by F. Bainbridge.

"Carburizing and Graphitizing Reactions Between Iron-Carbon Monoxide and Carbon Dioxide," by M. L. Becker.

"An Experimental Inquiry Into the Interactions of Gases and Ore in the Blast Furnace. Part II—Carbon Deposition at 450 Degrees Cent. and Its Influence Upon the Ore Reduction; Equilibria Between Gases and Ore at 650 to 1000 Degrees Cent." by W. A. Bone, L. Reeve and H. L. Saunders.

"The History of the Cementation Process of Steel Manufacture," Part I by D. Brownlie; Part II by Baron de Laveleye.

"The Metallography of Some Ancient Egyptian Implements," by Sir H. C. H. Carpenter and J. M. Robertson.

"Alloys of Iron Research. Part IX—The Constitution of the Alloys of Iron with Silicon," by J. L. Haughton and M. L. Becker.

"Chromium-Copper Structural Steels," by J. A. Jones.

"The Corner Ghost in Steel Ingots," by S. Maita.

"Tin and Sheet Mill Rolls. Their Treatment, Performance and Premature Failure in Service," by E. Mort.

"The Effect of Melting Conditions on the Microstructure and Mechanical Strength of Gray Cast Iron Containing Various Amounts of Carbon and Silicon," by A. L. Norbury and E. Morgan.

"The Properties of Some Steels Containing Chromium," by A. R. Page and J. H. Partridge.

"Single-Sheet of Thin-Pack Normalizing, or Heat Treatment Versus Box Annealing of Sheets," by R. Whitfield.

Following the meeting in London another will be held in Birmingham on May 6 with a third in Swansea on May 13. At these meetings seven of the papers presented at the London meeting will be discussed. The autumn meeting of the institute will be in Prague, Czechoslovakia, Sept. 15-20.

New Generating Unit To Supply Steam

A steam generating unit has been designed and constructed by the Combustion Engineering Corp., New York, with a capacity of 750,000 pounds of steam per hour. The unit is for installation at the Kips Bay power station of New York Steam Corp. and will supply steam for several new office buildings in the district including the Empire State building. Coal consumption at maximum capacity is 64,000 pounds per hour. The installation comprises a 3435-horsepower double Ladd-type boiler tangentially fired by a pulverized fuel system. The furnace is equipped with bare tube, all-metal water-cooled walls and plate-type air preheaters for reclaiming heat in waste gases.

Plan Export Conference

Arrangements for a New England export conference, to be held in Boston May 14, are being completed, according to an announcement by Victor M. Cutter, president, United Fruit Co., Boston, and chairman of the external relations committee of the New England council. The conference will be convened by the council in co-operation with a number of industrial and other business organizations in the New England states having an active interest in promoting increased sales of New England products in foreign markets.

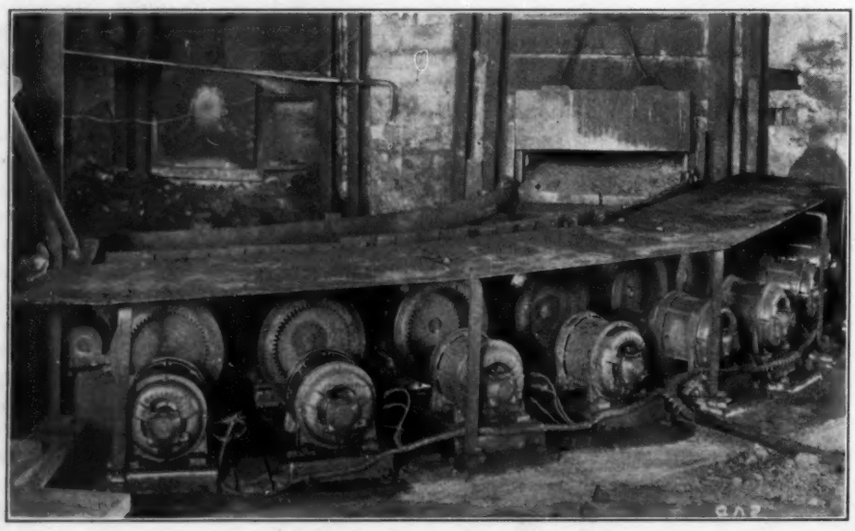
Aircraft Designers Plan 100-Ton Metal Ship

Following closely upon the successful trials of the first all-metal dirigible, the United States Navy ZMC-2, the Detroit Aircraft Corp., Detroit, is designing a 100-ton metal clad airship which is to have a cruising speed of 100 miles per hour. The new ship, to be known as MC-38, will be about 250 feet long, 115 feet in diameter, equipped with 4800 horsepower, and will have sleeping accommodations for 50 passengers. In addition to the 50 passengers it can carry a substantial load of mail and express over any range up to 2000 miles.

The speed and power of this ship will enable it to successfully outrun any storms encountered, as such disturbances rarely travel faster than 35 miles per hour. It will have two-way radio connections for further safety. Metal construction permits a much larger internal gas pressure more than five times that of the Shenandoah, eliminates absorption of water and consequent increase in weight, reduces gas leakage to a minimum, considerably reduces danger from fire, and defers deterioration of covering from the elements.

H. V. Dockray Brass & Iron Co., Zanesville, O., has changed its name to the Wise Foundry, Machine & Supply Co. Louis H. Wise is president and general manager.

Table Rollers Driven by Separate Motors



ALTERING the method of transferring billets from a heating furnace to the first stand of rolls in a mill train recently was accomplished with rollers driven by individual motors. The conveyor table, which receives the billets from the hearth of the furnace, is shown in the accompanying illustration. Separate induction motors, built by the Reliance Electric & Engineering Co., Cleveland, are employed for actuating the eight rollers. The drive is through a pinion and an internal spur gear, all motors being controlled through a single starter.

Editorials

Bethlehem Now a National Figure

NOTWITHSTANDING the threat of Cyrus S. Eaton and associates to wage legal warfare indefinitely against the sale of the Youngstown Sheet & Tube Co. to the Bethlehem Steel Co. the fact that the requisite two-thirds of Sheet & Tube common stock has been voted favorably is a positive accomplishment.

For the good of the litigants and the steel industry as well, it is to be hoped that the legal proceedings will be expedited and the merger disappear from the headlines. It was a mistake to let the matter develop into an open fight. Distrustful minds at Washington have been nourished. Animosities in the industry which will long remain have been fired.

Pending final adjudication of legal matters, it is understood that Sheet & Tube will continue on its present basis. Gradually, however, the economic necessities will compel a close tie-in with Bethlehem. Both companies have a good record and the union should be mutually helpful.

Bethlehem now becomes a national figure. Heretofore it has had no steelmaking capacity west of Buffalo and Johnstown, excluding the west coast properties recently purchased. The Sheet & Tube works at Youngstown and Indiana Harbor provide Bethlehem relatively greater capacity west of Pittsburgh than the United States Steel Corp. has in the East, which is Bethlehem's home territory. At every point save the South, Bethlehem is represented, and the acquisition of a property there would appear logical.

Assuming the current merger is consummated, Bethlehem will have ingot capacity totaling 13,000,000 tons, exactly one half that of the Steel corporation, giving effect in both cases to current construction. Of the nation's 62,000,000 tons of ingot capacity, these two interests will control 63 per cent. Consumers as well as other producers will closely appraise the effects of this concentration, which has great possibilities for stabilization.

Chrome-Nickel Steel Data Complete

CHROME-NICKEL steel of the 18 per cent chromium 8 per cent nickel classification was produced in the United States in 1929 to the extent of 25,000 tons. The alloy was developed in Germany by the Krupp organization and approximately one year ago the Krupp Nirosta Co. Inc. was formed to hold American rights on processing. So great has grown the demand for this heat, corrosion and acid resistant material in this brief time that at present 4 companies hold original steelmaking licenses, 17 companies have conversion licenses and 16 companies possess casting licenses. The list of licensees is growing.

Potential demand exceeds producing capacity and it appears likely that for some time ahead consumption will be limited to the ability of finishing capacity to make the steel available for the market. A number of problems incidental to production have been overcome and now 18-8 can be had in the principal rolled forms. Moreover, research work has resulted in slight variations in chemical analyses making the alloy useful for purposes which originally it did not serve. Experience in processing and fabricating the metal has permitted working out standard procedure.

The increasing popularity of the chrome-nickel alloy, because of its ability to acquire and hold a high polish, to resist corrosion and to resist heat, has created a need for some complete and authentic exposition of chemical specifications, physical properties, heat and corrosion characteristics and particularly methods of fabrication. To provide this information, IRON TRADE REVIEW presents on Page 45 of this issue the initial of two articles containing the first comprehensive and authoritative material published. Compiled from data supplied by Krupp Nirosta licensees, these articles will give information heretofore not available.

Why Upset Open-Shop Policy?

ANY interruption in erection of the steel framework of a building is immediately reflected in delays in other phases of construction. When the hoisting derricks become silent due to labor troubles or other reasons, the work soon comes to a halt. Building costs mount high.

The action of the Structural Steel Board of Trade of New York last week in declining the offer of Ex-Gov. Alfred E. Smith to mediate its long-standing open-shop policy with the union was to be expected. It was no fault of the board that Governor Smith, president of the company erecting the 85-story Empire State building in New York, unwittingly placed the steel for his building

with an open-shop interest, to the governor's distress as a politician and friend of union labor.

Assured of fairly-steady operations in steel erecting without local and often petty labor troubles, due largely to this open shop, it would have been folly for the board to change the policy. Such action might and probably would throw steel erecting into the realm of trade union politics. This craft has been fairly free from labor troubles in New York in recent years. Many times while other organized crafts have been engaged in strikes and controversy on various jobs, the steel work has gone on. It has been ready for the other unions to take hold when the trouble has been ironed out. Had the steel work been halted, the letdown would have been general and the delay longer in resuming operations. It should be also noted that much of the delay in other buildings trades can be later made up by overtime, but letdowns in steel work are irreparable.

The policy that has kept the steel going up is a wise one. Some of the most ardent trade unionists are not anxious to see steel erecting held up for any reason. Cost of building, already high, would mount higher had any change been made in this long standing attitude of the Steel board.

March No Longer Leads Steel Year

AMONG other things, the automotive industry appears to have disturbed the rhythm of the steel production year. Time was when March could be counted on as the high point of the year. For example, from 1924 to 1927 inclusive, due to the preponderance of railroad business, the daily ingot rate was building up to a peak in March, only to fall away over the remainder of the year.

But in 1928, when the automotive industry displaced the railroads as the premier consumer of finished steel, there were twin peaks of ingot production—in April and October. Last year, when the industry barely was nosed out of first place by the railroads, May and June were in a dead heat for the pinnacle of output.

The decline of 2 per cent in the ingot rate last month, contrasted with a 4 per cent gain in pig iron, probably reflected the consumption situation accurately, since open-hearth furnaces are more sensitive to changing market conditions than blast furnaces. But it is most unusual for March to develop a recession from February. In fact, in the 13 years in which the American Iron and Steel institute has been compiling monthly statistics, this has occurred only three times. In 1919 and 1921 the decline in March was followed by a shrinkage into midyear. Nothing in the present market situation, however, foreshadows a repetition this year.

What Our Readers Are Thinking

The New Era in Steel

By B. F. Fairless,
President, Central Alloy Steel Corp.,
in *The Welder*

NEVER in the history of steel has there been the restless experimenting that is taking place today and, by the same token, never have new developments appeared in such quick succession. New processes ranging from the first handling of the ore to the final processing of the sheet or tube all serve to keep the industry on tip-toe.

Unless broad new markets are found for steel products there seems to be some doubt as to whether there will be room for all of these new developments in the steel industry as it is now set up. While great secrecy surrounds the process, attempts have been made (presumably with some success) to reduce iron ore direct to iron without the conventional blast furnace. Mechanical puddling of wrought iron is now an established fact and one plant is in large scale production. By this process a two-ton converter has the same output as 88 old-fashioned puddling furnaces. Centrifugal casting of ingots as demonstrated at our Canton plant will, when perfected, eliminate ingot molds, soaking pits and blooming mills.

Sheet mill practice, which experienced no major improvement in 150 years, has almost been revolutionized in the past three years by such short cuts as pack furnaces, continuous normalizing furnaces and others. The improvements made along this line in our own plants lead to the thought that many other processes might likewise be improved and shortened.

Other important developments on the steel horizon include the continuous rolling of sheets, which is going to bring enormous new tonnage of sheets into the market within two or three years, with seven such plants already built or contemplated. Cold-rolling processes also are being radically revised, while the fast electrical welding of tubes and pipe, as well as the practically continuous methods developed for seamless tube manufacture seems to spell the doom of the old fashioned lapwelding process.

New materials have been coming almost as rapidly as new processes to complicate the picture still further. Enduro and Nitralloy come under this head. Both are destined to find very much broader markets, at the expense of other materials. It seems that if the steel industry is to maintain its position, steel must replace wood and other materials on a tremendous scale. Likewise the common steel products must in turn be replaced by alloys and special steels.

All this can have but one effect on steel prices and competition. The struggle will become increasingly more severe as time goes on. Not only will constant research be necessary from the metallurgical side, but new operating and production economies must be worked out so that the new competition may be met.

This serious problem is a responsibility which everyone must share. Most of us are so close to our jobs that we can't see the woods for the trees. Things are happening too rapidly in the steel business today for anyone to be satisfied with things as they are.

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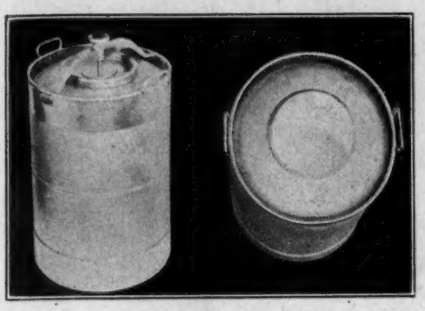

New chromium-nickel steel finding wider application. Page 45.

New Steel Has Vast Field of Usefulness

CONSIDER a steel with such a remarkable range of adaptability that it can be used as a setting for a jewel, a watch case, or a dental plate, and in innumerable forms all the way up in size to gigantic ornaments to glisten from the peaks of skyscrapers, or again for railroad-car tanks to carry safely the most corrosive liquids. A steel retaining indefinitely a silvery luster, and possessing extraordinary corrosion resisting properties! Impossible as it would have seemed a few years ago such a steel has been developed, modern metallurgy accomplishing something better than the alchemists of old tried to create with their magic. This steel has the properties of many other metals, and that it is fulfilling its promises is evident from the fact that it is approaching a large production basis. The article beginning on page 45 will give readers an idea of the superlative adaptability of the metal. It is the first complete and authentic description of the Krupp nirosta steel.

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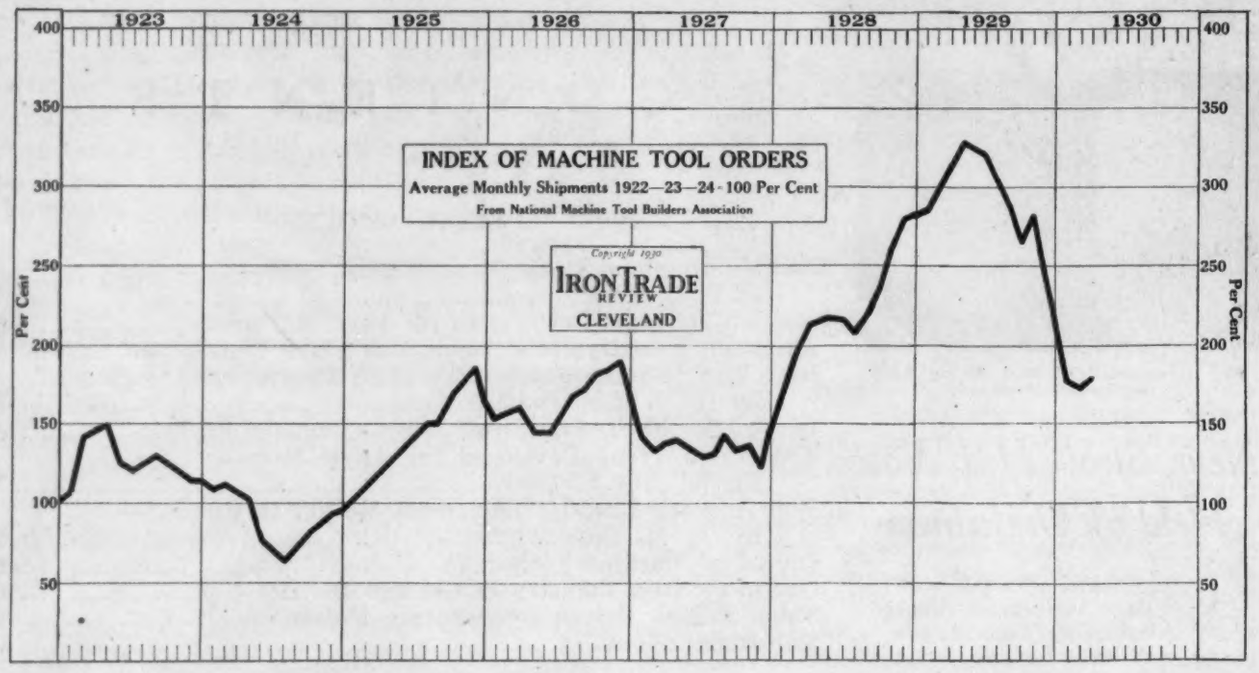
The Business Trend



Improvement In Business Is Not Rapid

QUICKENING of automobile production and building construction programs, an optimistic stock market, warmer weather and improvement in the commodity price situation are contributing to a growing confidence in the outlook for better business, if not immediately, at least in months to follow. Evidences of poor business still are plentiful, however.

FOR the first time since last October the three month's moving average of machine tool orders compiled by the National Machine Tool Builders' association advanced during March, rising to 177.8 compared with 172.6 for February and 320.8 for March, 1929. The increase is not great enough to be looked upon as a definite turn in the trend but it is hopeful sign that industry soon may require new equipment to meet greater consuming demand for finished goods.

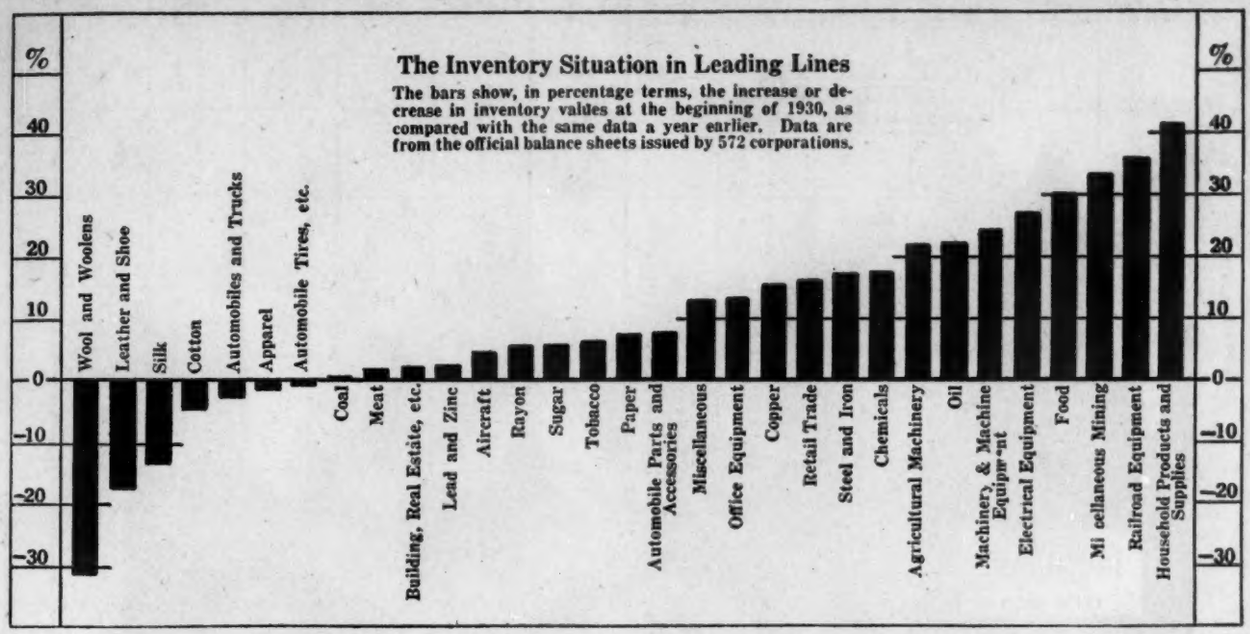
ORDER cancellations in 1920 created surplus stocks which for months overhung the market. Last month nearly 20 per cent of the machine tool makers received cancellations, which was twice as many as in February. They were spread out, however, giving no evidence of a general tendency to cancel orders.

SEVERAL of the weekly indexes of commodity prices now show a slightly upward movement. Crude oil and gasoline prices are higher. Wheat is lower. Dun's list of wholesale quotations shows 25 out of 52 price changes last week were upward, a much larger proportion than a few weeks ago. Stable or rising prices, when and if they develop, may sharply stimulate trade and industry.

STEEL producers look hopefully toward the automotive and building industries as new railroad buying becomes less important. Auto builders are stepping up schedules but cautiously keep a foot near the brake. March building contracts were 45 per cent greater than in February, but 5 per cent smaller than in March, 1929, making last month's dollar volume the smallest for any March since 1924. Oddly, contemplated work reported in March was $47,000,000 less than in February, and $153,000,000 less than a year ago.

AS THE year advances it becomes clearer that industrial recovery is proceeding, but not rapidly. The stock market chooses to discount expected improvement months ahead but the slowness of trade revival tempers optimism on the part of those at the helm of business.

The Business Trend

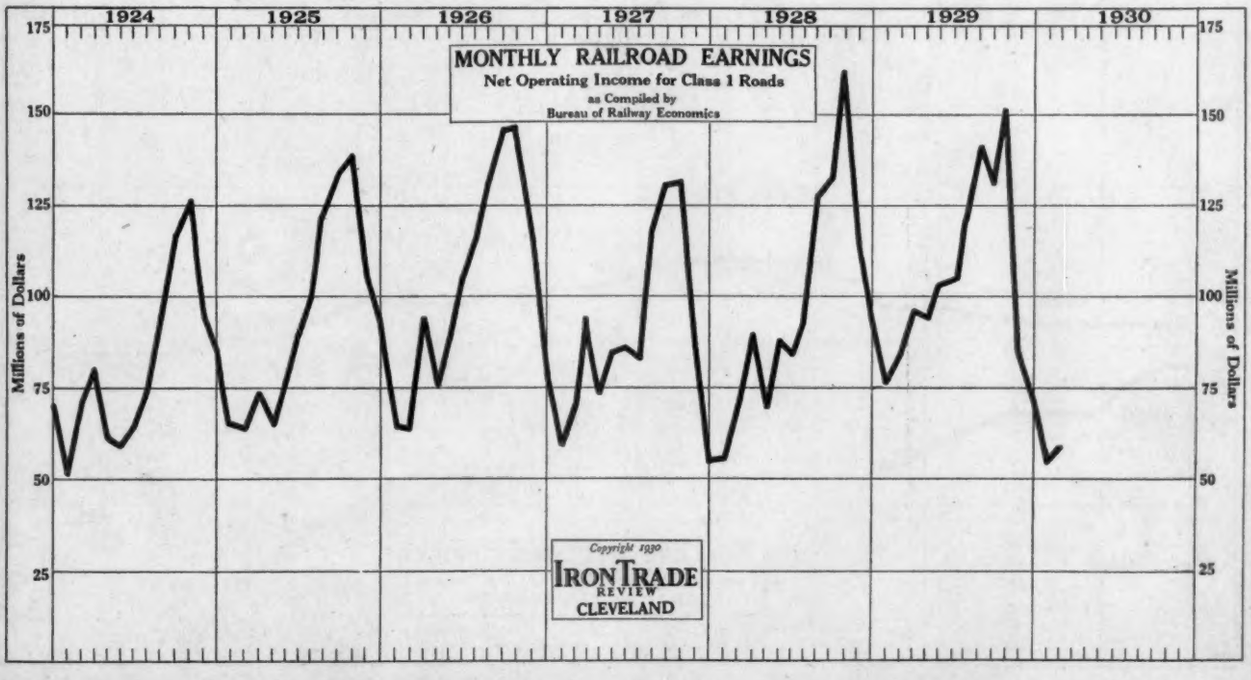


Inventories

AN ANALYSIS by the Standard Trade and Securities Service of the balance sheets of 572 representative domestic companies reveals that inventories at the beginning of 1930 averaged 11.5 per cent greater in dollar value than at the beginning of 1929. The cash position of these companies showed a decline for the year of 8.9 per cent while plant valuations during 1929 were increased 6 per cent. Thus this survey indicates that in certain respects industry entered 1930 in a less healthy condition than in either of the two preceding years.

Railroad Earnings

NET operating incomes of Class 1 railroads in February was $59,432,006, a decline of about 30 per cent compared with earnings reported for February, 1929, when they totaled $84,723,651, according to the bureau of railway economics. Compared with January's net income of $55,717,-119, earnings for February showed a gain of about 7 per cent. This was less than the usual seasonal average, however. February earnings were at the annual rate of 3.76 per cent on property investment against 6.27 per cent for February, 1929.



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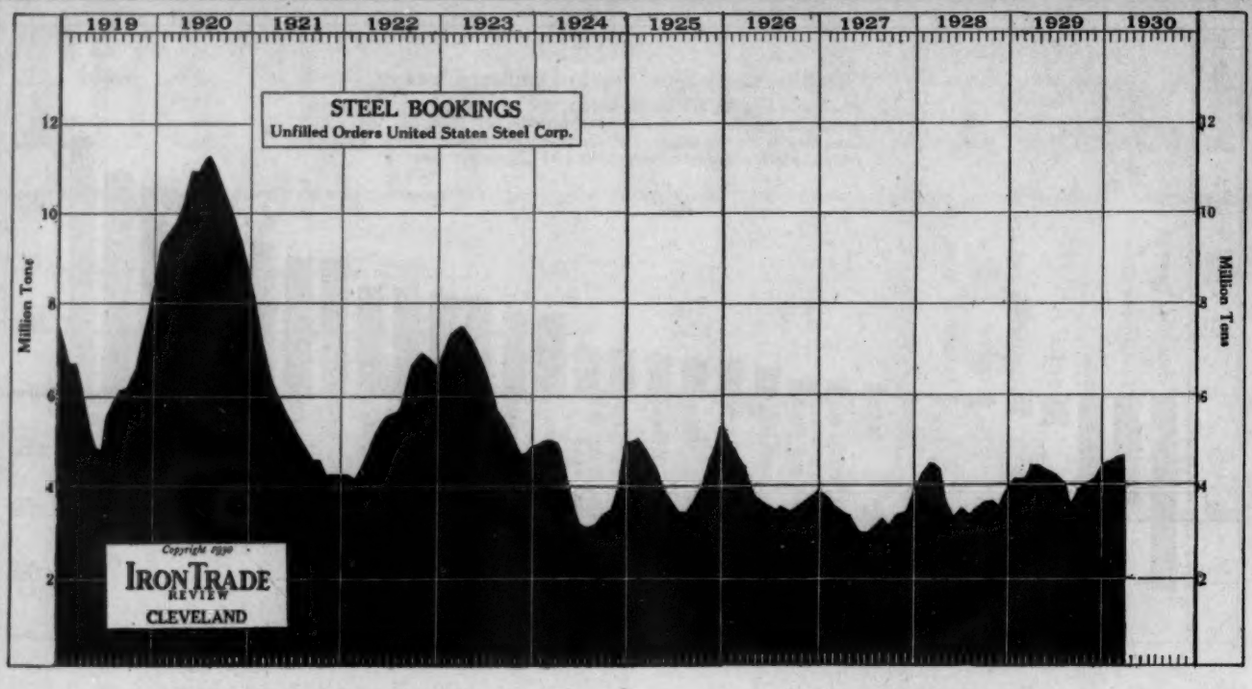
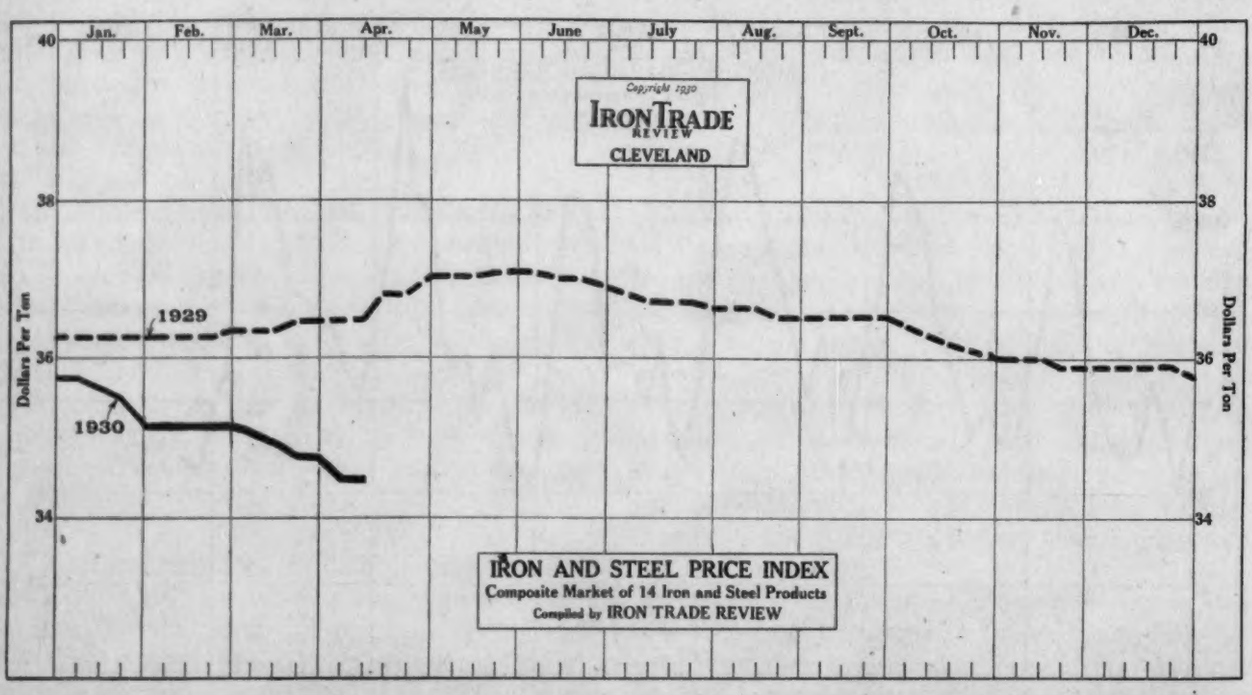


Unfilled Steel Orders

UNFILLED steel orders on the books of the United States Steel Corp. as of March 31 showed a seventh consecutive monthly increase. The gain in this case was 90,905 tons, or about 2 per cent, compared with the 4,479,748-ton total at the close of the previous month. This brought unfilled bookings to 4,570,653 tons, the largest since February, 1926. Unfinished business at the beginning of April was 4 per cent larger than one year before when 4,410,718 tons were on the Steel corporation's order books.

Steel Price Index

IN THE past six weeks the general level of iron and steel prices, as measured by IRON TRADE REVIEW'S index, has dropped nearly 75 cents a ton. Each week this index has slipped slightly until now it stands about 6.25 per cent lower than a year ago. The composite price of 14 products has dropped about $2.30 a ton in the past year to around $34.50 a ton. This compares with last year's peak of $37.07 in June. After ten months of recession finished steel prices are working toward more stable levels.



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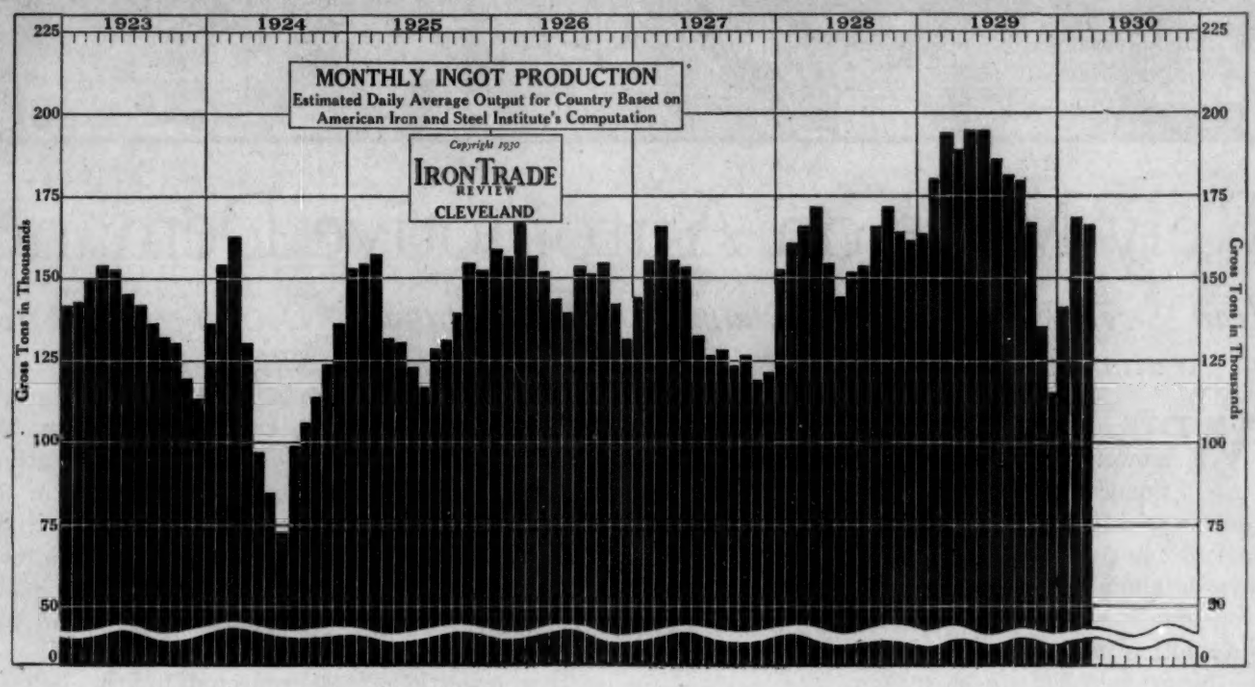
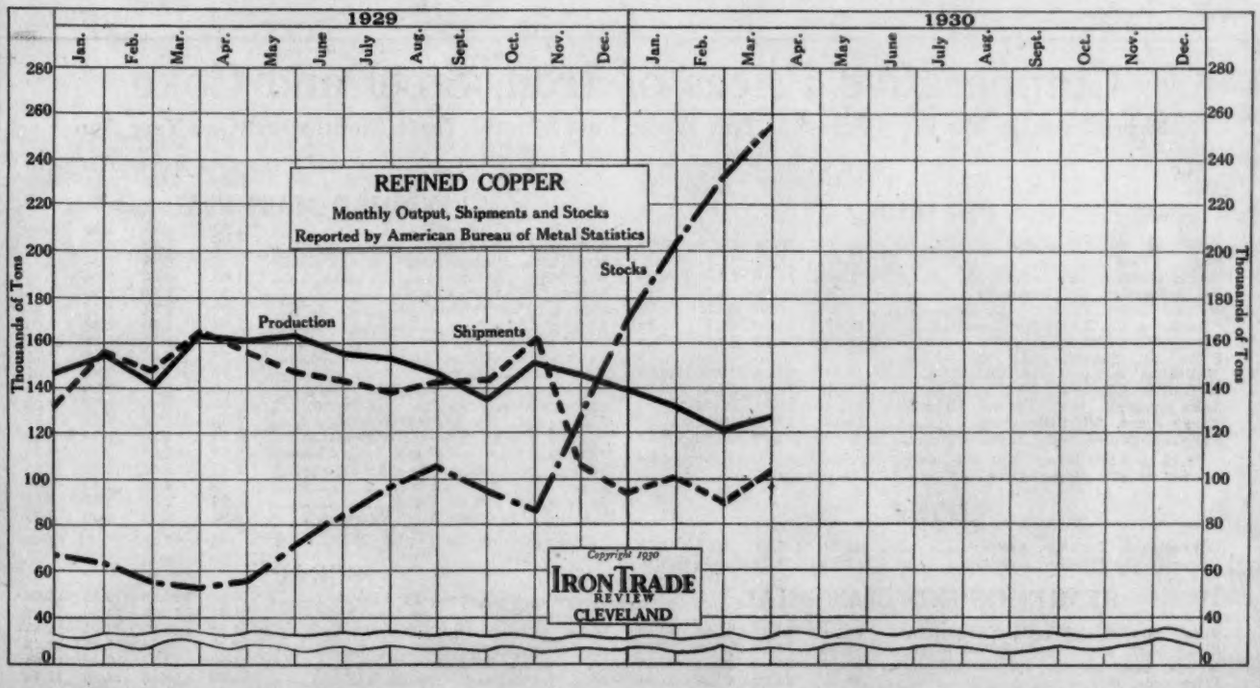


Steel Ingot Production

STEEL ingot production, which ordinarily expands in March, this year declined 2 per cent following three months of rising activity. Average daily output, according to the American Iron and Steel institute, was 164,961 gross tons, compared with 169,499 tons in February and 194,548 tons in March, 1929. Last month's rate of output was 16 per cent lower than one year before. Steelmaking operations frequently reach their peak for the year in March but last year May and June were the peak months.

Copper Situation

STOCKS of refined copper again increased in March, rising to 256,020 tons. This was an increase of 22,897 tons. It brings stocks to the highest level since January, 1922. Output increased 5867 tons although the average daily rate was cut to 4099 tons, 229 tons under that for February. March shipments totaled 104,167 tons compared with 91,476 tons in February, this gain being partly accounted for by the longer month. The price of copper was cut 4 cents a pound to 18.00c, delivered Connecticut, on April 15.



Rely More on Automotive Demand

Iron, Steel Producers View Quarter's Fate in Hands of Detroit—Price Situation Unsettled —Buyers Conservative—Pig Iron Shipments Up

WITH the general manufacturing trade slower, pipe line projects difficult to finance, the railroads at the season when their equipment orders slacken and their specifications for track material diminish, and structural awards sluggish despite an unusually good week, iron and steel producers increasingly look to the automotive industry for support.

Ford Gains Dominant in Auto Demand

Due in large measure to Ford, this is forthcoming in a moderate degree. The automotive situation still lacks the vigor which usually characterizes it at this season, but sheet, strip and bar mills in the Pittsburgh, Youngstown and Cleveland districts note slight improvement in demand from Detroit.

Opinion within the iron and steel industry is mixed. Some believe that slow but steady gain in automotive production coupled with a fair volume of bridge and highway construction and the large public works program being fostered by the government will maintain the industry at a fair level through the customary summer lull.

Others are apprehensive that as specifications for material for railroad equipment bought in the last ninety days are worked off, and this will not be long, the industry will drop into a pocket from which nothing will extricate it until fall. The latter opinion is rather typical of the East and the former of the Middle West.

This unsettlement is reflected by the delicate balance in the operating situation. As noted last week, whatever change has developed in the past week in the various districts has been on the side of improvement. Cleveland mills have expanded from 76 per cent to 82, neutralizing the loss of 2 points, to 68 per cent, at Youngstown, Chicago mills hold at 90 to 95 per cent, Pittsburgh at 75 and Buffalo at 77. Steel corporation subsidiaries, however, are at 80 per cent, compared with 83 per cent April 1.

Little Attempt to Support Market

In the heavy finished steel lines there is a wider application of preferred prices, the 1.80c

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

PIG IRON

	April 16, 1930	March 1930	Jan. 1930	April 1929
Bessemer, del. Pittsburgh	$20.76	20.76	20.76	20.26
Basic, valley	18.50	18.50	18.50	18.00
Basic, eastern, del. eastern Pa.	18.76	18.80	19.20	20.25
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	19.86
No. 2 foundry, Chicago	19.50	19.50	20.00	20.00
*Southern No. 2, Birmingham	15.00	14.50	14.70	15.50
**No. 2X, Virginia Furnace	18.25	18.25	18.25	20.75
**No. 2X, Eastern del. Philadelphia	20.76	20.76	21.56	22.26
Malleable, valley	19.00	19.00	19.00	18.50
Malleable, Chicago	19.50	19.50	20.00	20.00
Lake Superior, charcoal, del. Chicago	27.04	25.04	27.04	27.04
†Gray forge, del. Pittsburgh	19.13	19.13	19.13	19.36
Ferromanganese, del. Pittsburgh	103.79	103.79	104.79	109.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $13 to $14, Birmingham. **2.25 to 2.75 silicon.

COKE

Connellsville furnace, ovens	2.60	2.60	2.55	2.75
Connellsville foundry, ovens	3.50	3.50	3.50	3.75

SEMIFINISHED MATERIAL

Sheet bars, open-hearth, Youngstown	33.00	33.00	33.80	35.00
Sheet bars, open-hearth, Pittsburgh	33.00	33.00	33.80	35.25
Billets, open-hearth, Pittsburgh	33.00	33.00	33.80	34.50
Wire rods, Pittsburgh	38.00	38.00	40.00	42.00

FINISHED MATERIAL

	April 16, 1930	March 1930	Jan. 1930	April 1929
Steel bars, Pittsburgh	1.80	1.85	1.90	1.95
Steel bars, Chicago	1.90	1.90	2.00	2.05
Steel bars, Philadelphia	2.12	2.12	2.17	2.27
Iron bars, Chicago	1.95	1.95	2.00	2.05
Shapes, Pittsburgh	1.80	1.80	1.90	1.95
Shapes, Philadelphia	1.81	1.81	1.91	2.06
Shapes, Chicago	1.90	1.90	2.00	2.05
Tank plates, Pittsburgh	1.80	1.85	1.90	1.95
Tank plates, Philadelphia	2.00	2.00	2.05	2.15
Tank plates, Chicago	1.90	1.90	2.00	2.05
*Sheets, blue anl., No. 18, Pittsburgh	2.25	2.25	2.30	2.15
Sheets, black, No. 24, Pittsburgh	2.65	2.65	2.70	2.90
Sheets, gal., No. 24, Pittsburgh	3.30	3.30	3.35	3.65
Sheets, black, No. 24, Chicago	2.80	2.80	2.90	3.10
*Sheets, blue anl., No. 13, Chicago	2.40	2.50	2.50	2.35
Sheets, galvanized, No. 24, Chicago	3.45	3.45	3.55	3.85
Plain wire, Pittsburgh	2.40	2.40	2.40	2.50
Wire nails, Pittsburgh	2.20	2.30	2.35	2.65
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.35

*Comparison for April, 1929, is with old blue annealed base, No. 10.

SCRAP

Heavy melting steel, Pittsburgh	16.00	16.60	16.55	18.60
Heavy melting steel, eastern Pa.	14.00	14.95	14.50	17.00
Heavy melting steel, Chicago	13.00	13.20	12.65	15.95
No. 1 wrought, eastern Pa.	15.25	15.25	15.25	16.25
No. 1 wrought, Chicago	13.50	13.50	13.40	16.65
Rails for rolling, Chicago	15.00	15.00	14.65	17.50

Current Prices for Rolled Steel Products

STEEL PLATES

Pittsburgh, base	1.75c to 1.85c
Philadelphia, del.	2.00c
New York, del.	2.025 to 2.075c
Boston, del.	2.165c to 2.265c
Chicago, base	1.90c to 2.00c
Cleveland, delivered	1.94c to 1.99c
Lackawanna, N. Y., base	1.90c to 1.95c
Birmingham, base	1.95c to 2.00c
Coatesville, Pa., base	1.90c
Pacific Coast, c.i.f.	2.30c
St. Louis, del.	2.17c
Detroit, del.	2.04c to 2.09c

STRUCTURAL SHAPES

Pittsburgh, base	1.75c to 1.85c
Philadelphia, del.	1.81c to 1.91c
New York, del.	1.895c to 2.00c
Boston, del.	2.165c to 2.265c
Chicago, base	1.90c to 2.00c
Cleveland, delivered	1.94c to 1.99c
Lackawanna, N. Y.	1.90c to 1.95c
Birmingham, base	1.95c to 2.00c
Bethlehem, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	2.04c to 2.09c

BARS

SOFT STEEL

Pittsburgh, base	1.80c
Chicago, base	1.90c to 2.00c
Birmingham, base	1.95c to 2.00c
Lackawanna, N. Y., base	1.95c to 2.00c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.80c
Cleveland, del., outside mills	1.80c to 1.825c
Philadelphia, del.	2.12c to 2.17c
New York, delivered	2.14c to 2.19c
Boston, delivered	2.165c to 2.265c
Detroit, del.	1.985c
Pittsburgh, cold finishing	1.90c to 2.00c
Pittsburgh, forging quality	2.05c to 2.10c

RAIL STEEL

Chicago Heights	1.85c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	1.95c
New York, delivered	2.07c
Philadelphia, delivered	2.07c to 2.12c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet cut lengths	2.10c
Stock lengths from mill	1.85c
Chicago, billet, 30 tons and over	2.00c
Under 30 tons	2.40c
Chicago, rail steel	1.70c to 1.75c
Road and bridge work	1.70c to 1.75c
Philadelphia, cut lengths	2.32c to 2.52c

CORROSION, HEAT RESISTANT ALLOYS

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets....35.00c; plates....31.00c; bars....28.00c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

SHEETS

SHEET MILL BLACK, NO. 24

Pittsburgh, base	2.65c
Detroit, delivered	2.84c
Philadelphia, delivered	2.92c to 2.97c
Gary, Indiana Harbor	2.75c
Chicago, delivered	2.80c
Birmingham, base	2.80c
St. Louis, del.	3.07c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.80c to 2.90c
Gary, base	2.95c to 3.05c

GALVANIZED NO. 24

Pittsburgh, base	3.25c to 3.30c
Philadelphia, delivered	3.57c to 3.62c
Gary, Indiana Harbor	3.40c to 3.50c
Chicago, delivered	3.45c to 3.55c
Birmingham, base	3.45c to 3.55c
St. Louis, del.	3.72c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.25c
Chicago, district mills	2.35c
Chicago, delivered	2.40c
St. Louis, delivered	2.57c
Philadelphia, delivered	2.57c
Birmingham	2.40c

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base	2.10c
Chicago district mills	2.20c
Chicago, delivered	2.25c
Philadelphia, delivered	2.42c
St. Louis, delivered	2.42c
Birmingham	2.25c

AUTOMOBILE NO. 20

Pittsburgh, base	3.80c
Detroit, delivered	4.09c

FURNITURE NO. 24

Pittsburgh	3.90c

(Turn to the following page)

to 1.85c, Pittsburgh, level on plates and shapes softening to a range of 1.75c to 1.85c, while bars are at a flat 1.80c. Contrary to past experience, producers appear to be making few efforts to strengthen the market. Concessions in wire nails have been recognized by a decline of 10 cents a keg, the new official quotation to jobbers being $2.20 and to the trade $2.30.

There is some speculation concerning the price course to be adopted by the Bethlehem Steel Co. in regard to the Youngstown Sheet & Tube Co., whose acquisition is being tested in the courts following a favorable vote of stockholders. Several years ago the Bethlehem company established basing points at its more important eastern mills. If this policy is adopted in the West, Youngstown would become a basing point for products made there, including sheets, wire products and pipe. Chicago, where Sheet & Tube now has several plants, already is a basing point.

Pig Iron Shipments Topping March

Colorless markets are the result both of the unsettled price situation and inert secondary demand. Buying of pig iron has further subsided, but shipments in practically all districts are higher, April promising to outrun March about 15 per cent. Pig iron prices generally are unchanged, as are coke. Iron and steel scrap, while weak, moves more narrowly, indicating it nears bottom in the present dip. Chicago mills are deferred four to six weeks in deliveries of plates and three to five weeks on shapes. Prospective pipe lines, including the 250,000-ton Texas-Chicago project, give indication they may come into the mill picture at a time when car builders' specifications are exhausted. At Pittsburgh bar, plate and shape bookings barely offset shipments.

Shape Awards in Good Increase

Structural steel awards this week, totaling 42,885 tons, were the largest since February.

In sheets, strip, alloy steel and other products moving largely to the automotive trade there is a shade of improvement. Open-market purchasers of semifinished steel are taking in more material. Railroads in the past week bought 1150 freight cars, leaving about 1300 freight and 48 passenger cars on inquiry. Michigan Central is repairing 1000 cars in its own shops.

March statistics on pig iron and steel ingot production in Great Britain record gains over February, but evidenced a declining trend toward the end of the month. Indian basic iron is again appearing in the British markets. Iron and steel markets on the Continent continue dull, with the Germans reported booking some export business below the formally-agreed syndicate prices.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (April 16, 1930)	$34.44
Last week (April 9, 1930)	34.52
One month ago (March, 1930)	34.95
Three months ago (January, 1930)	35.56
One year ago (April, 1929)	36.81
Ten years ago (April, 1920)	67.49
Fifteen years ago (April, 1915)	22.66

The reduction in wire nails forced the IRON TRADE REVIEW composite of 14 leading iron and steel products down 8 cents this week, to $34.44, its lowest since March, 1922. For seven consecutive weeks this index has declined.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted on Last Editorial Page—See Preceding Page For Other Products

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts.	1.80c to 1.90c
Delivered, Detroit	2.09c
Hot strip 6 1/4 to 24-in., Pitts.	1.70c to 1.80c
Delivered Detroit	1.99c
Hot strip, bands 6 in. and under, Chicago	1.90c to 2.00c
Do. 6 1/4 to 24	1.80c to 1.90c
Cooperage stocks, Pittsburgh	2.00c to 2.10c
Do. Chicago	2.10c to 2.20c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 tons and over)	2.55c to 2.65c
Delivered, Detroit	2.785c to 2.885c
Worcester, Mass. (3 tons and over)	2.80c to 2.90c

ALLOY STEEL

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differentials	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 125-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanad'm	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rounds, squares)	0.50	3.15

Hot rolled alloy billets 4 x 4-inch and over take same prices per gross ton as same specification alloys bars per net ton. Sizes under 4 x 4 to 2 1/2 in. x 2 1/2 in. inclusive sold on bar basis plus steel bar card extras for size. Sizes under 2 1/2 in. x 2 1/2 in. take bar price on net ton basis.

COLD FINISHED STEEL

Bars, drawn or rolled, Pitts., Chi., Buffalo, and Cleve. c.l.	2.10c
Do, delivered, Detroit	2.335c
Shafting (turned, polished) Pittsburgh, Buffalo	2.10c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.45c to 2.90c

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)
(To Merchant Trade)

Standard wire nails	$2.20 to 2.30
Cement coated nails	2.20 to 2.30
Galvanized nails	4.20 to 4.30
(Per pound)	
Polished staples	2.75c to 2.85c
Galvanized staples	3.00c to 3.10c
Barbed wire, galvanized	2.95c to 3.05c
Annealed fence wire	2.45c to 2.55c
Galvanized wire	2.90c to 3.00c

Anderson, Ind., $1 higher. Chicago, $2 higher, Duluth, Birmingham $3 higher.

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Bright plain wire, 6 to 9 gage	2.40c
Spring wire	3.40c
Wire, delivered Detroit	2.535c
Nails, delivered Detroit	$2.535

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland base on products made there; Duluth $2 higher; Fairfield, Ala., $3 higher.

CUT NAILS, CHAIN, PILING

Cut nails, c.l., f.o.b. mills	2.55c
Cut nails, l.c.l., f.o.b. mills	2.65c
Sheet piling, base, Pittsburgh	2.10c to 2.20c

Chain proof BB and BBB, Pitts.

3/16-in. to 1/2-in.	33 1/3 and 5 off
9/16-in. to 1 1/2-in.	33 1/3 off

CAST IRON WATER PIPE

Class B Pipe—Per Net Ton

Six-inch and over, Birming'm.	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six-inch to 24-inch, Chicago	45.20 to 46.20
Six-inch and over, New York	38.50 to 40.50
Four-inch, New York	41.50 to 42.50
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

TIN PLATE; TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25
Gary, Ind., base 10 cents higher.	
Long ternes, primes, No. 24	3.90c

*Price subject to quantity differentials.

WASHERS

Wrought, c.l., Pitts. dist.	$6.50 to 6.75 off
Wrought, l.c.l, Chicago dist.	$6.80 to 6.90 off
Wrought, c.l., Chicago	$7.00 to 7.10 off

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$25.00 to 29.00
Light rails, 25 to 45, mills	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, mills	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	70 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

BOLTS AND NUTS

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lists, apply to lists of April 1, 1927. Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	60 to 70 off
Rolled thread 3/8 x 6 and smaller take 10 per cent lower list.	
Eagle list	60 to 70 off

MACHINE BOLTS

All sizes, cut thread	60 to 70 off
Rolled thread 3/8 x 6 and smaller take 10 per cent lower list.	
Lag screws	60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads	60 to 70 off
Tap bolts	60 to 70 off
Blank bolts	60 to 70 off
Stud bolts without nuts	60 to 70 off
Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2 1/2 off in bulk.	
Tire bolts	60-5 off

Nuts

Semifinished	60 to 70 off

HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85-10 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

RIVETS

Struc., c.l., Pitts.-Cleve.	3.10c
Structural, c.l., Chicago	3.20c
**7/16-inch and smaller, Pitts.	70 and 10 off
Chi., Cleve.	70 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Raw Materials and Semifinished Products

SEMIFINISHED STEEL

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	38.30
Chicago	35.00
Forging, Chicago	40.00
Forging, Pittsburgh	38.00
Forging, Philadelphia	43.30

SHEET BARS

Pittsburgh	$33.00
Youngstown	33.00
Cleveland	33.00
Chicago	35.00

SLABS

Pitts., Young.	$33.00
Cleveland	33.00

WIRE RODS

Pittsburgh, Cleveland	$38.00
Chicago	39.00

SKELP

All grades, Pittsburgh	1.80c to 1.85c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51 1/2 %	$4.80
Mesabi bessemer, 51 1/2 %	4.65
Old range nonbessemer, 51 1/2 %	4.65
Mesabi nonbessemer, 51 1/2 %	4.50
High phosphorus, 51 1/2 %	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63% (contract)	10.00
Copper-free low phos. 58-65%	nominal

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55%, iron, 6-10% manganese	11.00 to 11.50
North African low phosphorus	11.50 to 12.00
Swedish basic, 65%	9.50 to 10.50
Swedish low phosphorus	11.50 to 12.00
Spanish and North African basic, 50 to 60%	10.00 to 11.00
Newfoundland foundry, 55%	9.00
Tungsten, future, short ton unit, duty paid	14.50
Chrome ore, 48%, net ton c.i.f.	$22.50

MANGANESE ORE

Prices, not including duty, are cents per unit; cargo lots.

Caucasian (52-55 per cent)	30 cents
Indian (48-50 per cent)	30 cents
Brazilian (46-48 per cent)	28 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide., gross ton	$19.50 to 20.50

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00
Ohio	43.00
Illinois	43.00
Kentucky	43.00
Missouri	43.00
Maryland	43.00
Georgia and Alabama	40.00 to 47.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK
Per Net Ton

9 x 4 1/2 x 2 1/2	65.00

MAGNESITE
Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	$40.00
Domes., Chewelah, Wash., base	22.00

CHROME BRICK
Net Ton Chester, Pa., and Baltimore base

9 x 4 1/2 x 2 1/2	$45.00

Pig Iron

Shipments Continue on Upgrade While Current Volume of Sales Declines—Stronger Market in North Central Territory

SHIPMENTS of pig iron thus far in April are 15 to 20 per cent ahead of those in the comparable days of March, leading northern producers report, while those from southern blast furnaces are among the highest on record. A large volume of business has been booked quietly for second quarter, and the buying movement having run its course current orders show a considerable decrease from those of recent weeks. Business is good but not spectacular, and prices appear to have reached bottom. Consumers' stocks are low, while furnaces generally have not been able to reduce theirs appreciably. Other Cleveland furnaces have been blown out and a valley merchant stack has been switched to low phosphorus iron, reducing output nearly 30,000 tons per month.

Pittsburgh, April 15.—Sales of pig iron are continuing at a steady rate but improvement over the quietness of the past several months still is lacking. Orders generally range up to 200 to 300 tons at a time for early needs. A slight pickup is noted in demand from small foundries, with several large steel foundries continuing full operations. Shipments this month are slightly lower than the comparable March rate and furnaces have not been able to move much iron from stock. Inquiry remains light. Quotations are unchanged but shading is noted occasionally, while long-term contracts with the largest melters take special prices. The general run of current business is going at $18.50, base, valley, for foundry iron, and $19 for bessemer and malleable. Basic is nominal at $18.50.

Boston, April 15.—The pig iron market is quieter, with sales for the past week aggregating 2000 tons. A few melters are inquiring for comparatively small lots. Prices are a shade easier than last week.

New York, April 15.—A slight recession is noted in pig iron sales, to 8000 tons for the past week. Inquiries total 7000 tons, including 2000 tons of foundry iron for the Thatcher Furnace Co. and 2000 tons of malleable for the Eastern Malleable Iron Co. Prices are moderately firm at $16.50 to $17, base, Buffalo, subject to occasional shading. Southern iron is holding at $18.50, delivered, New York docks. American Locomotive Co. has closed on 400 tons for Schenectady, N. Y.

Buffalo, April 15.—Buffalo producers sold more than 6000 tons of iron in small lots during the past week. The usual price for eastern delivery is $16.50, base Buffalo. Some iron is being sold for delivery by canal after May 1.

Cleveland, April 15.—Sales of pig iron show further shrinkage while shipments continue upward. New orders booked by Cleveland furnace interests during the past week totaled 18,000 tons, compared with 21,000 tons in the week preceding. Melters who have not covered known requirements for second quarter see no incentive to make large purchases under prevailing conditions. Stocks in consumers' hands are low and a pick up in steel probably would have an immediate effect in strengtheening the pig iron market. The Corrigan, McKinney Steel Co. has blown out one of its four blast furnaces. Otis Steel Co. blew out one of its two stacks two weeks ago. A valley furnace competing with Cleveland sellers is going on low phosphorus iron exclusively. Thus 80,000 to 90,000 tons of foundry iron will be removed from the market in the next three months, if no change is made in the status of these stacks. Small orders in the Cleveland district became more numerous in the past week. Shipments by blast furnace interests in the first two weeks of April were 15 to 20 per cent larger than in the comparable period of March. Prices are steady at $19, base, Cleveland furnace, for local delivery, and $18.50 for outside shipment. Lake furnaces continue to quote $19 to $19.50, base, for shipment in northern Indiana and lower Michigan.

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$19.00
Bessemer, del. Pittsburgh	20.76
Basic, valley furnace	18.50
Basic, Pitts. dist. fur.	19.00
*Basic, del. Pitts.	19.63 to 20.13
Basic, del. eastern Pa.	18.76 to 19.25
Basic, Buff. fur. for local del.	18.00
Malleable, valley furnace	19.00
Malleable, Pitts. dist. fur.	19.50
*Malleable, del. Pittsburgh	20.13 to 20.63
Malleable, Cleve. fur. for local del.	19.00
Malleable, Chicago furnace	19.50
Malleable, Buff. fur. for local del.	19.00
Malleable, del. eastern Pa.	20.26 to 22.40
Malleable, Granite City fur.	19.50
No. 1 foundry, Chicago furnace	20.00
No. 1X, Eastern, del. Phila.	21.26
No. 1X, Buff.. fur. for local del.	20.00
No. 2 foundry, valley furnace	18.50
No. 2 fdy., Pitts. dist. fur.	19.00
*No. 2 foundry, del. Pittsburgh	19.63 to 20.13
No. 2 plain, Buff. fur. for local del.	18.50
No. 2 foundry, Chicago furnace	19.50
No. 2 fdy., Cleve. fur. for local del.	19.00
No. 2 fdy., Granite City	20.00
No. 2 plain, del. Phila.	20.26
No. 2 plain, Virginia furnace	17.75
No. 2 plain, Buffalo, del. Boston	21.41 to 21.91
No. 2 Brooklyn, Buffalo, all rail	21.41 to 21.91
No. 2, Newark, Buffalo, all rail	19.78 to 20.28
No. 2 Ala., Bir. base, local del.	14.00
No. 2 Tenn., Bir. base, local del.	15.00
No. 2 Tenn., del. Cincinnati	16.69 to 18.19
No. 2 Alabama, del. Cincinnati	16.69 to 18.19
No. 2, Alabama, del. Cleveland	19.51 to 20.51
No. 2, Alabama, del. Chicago	18.20 to 19.01
No. 2 Alabama, Del., St. Louis	18.42 to 18.92
No. 2 Ala., Phila., dock dely.	18.25 to 19.25
No. 2 Ala., Balt., dock dely.	18.00 to 19.00
No. 2 Ala., N. Y., dock dely.	18.50
No. 2 Ala., Boston, dock dely.	20.21
No. 2X, Brooklyn, Buffalo all rail	21.91 to 22.41
No. 2X, Newark, Buff. all rail	20.28 to 20.78
No. 2X, eastern, del. Phila.	20.76
No. 2X, Buffalo, fur. for loc. del.	19.00
No. 2X, Buffalo, del. Boston	21.91 to 22.41
No. 2X, Virginia furnace	18.25
Gray forge, Pitts. dist. fur.	18.50
*Gray forge, del. Pittsburgh	19.13 to 19.63
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.76
Low phos., copper bearing fur.	23.00 to 23.50
Charcoal, Superior, del., Chicago	27.04

*Freight from Pittsburgh district furnace to points in Pittsburgh district 63.00c, 76.00c and $1.13 per ton.

CANADIAN PRICES

No. 1 foundry, del. Toronto	$22.60
No. 1 foundry, del. Montreal	24.00
No. 2 foundry, del. Toronto	22.10
No. 2 foundry, del. Montreal	23.50
Malleable, del. Toronto	22.60
Malleable, del. Montreal	24.00
Basic, del. Montreal	22.50

Silvery iron, Jackson county, O., furnace in per cents: 5—$22; 6—$22 to $23; 7—$23 to $24; 8—$24 to $25; 9—$25 to $26; 10—$27 to $28; 11—$29 to $30; 12—$31 to $32; 13—$33 to $34.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$41; 16—$43.50; 17—$46.50.

Chicago, April 15.—Conditions are not especially favorable to contracting for pig iron for shipment here by vessel from eastern furnaces and only one cargo has been taken in the open market, in addition to a cargo sold directly by an eastern furnace for shipment to Milwaukee. Blowing out of two furnaces in Cleveland will reduce the potential supply from there. Conservative buying policies here also have checked activity in the market for so-called boat iron. Forward contract tonnages, however, are growing heavier and shipments from northern furnaces so far in April are ahead of those in March. The short range buying policy tends to strengthen the price of $19.50, base, quoted by furnaces in this district. Three hundred tons of southern iron was sold in northern Illinois in the past week. Delivered prices on southern iron range from $18.20 to $19.01.

Cincinnati, April 15.—Few melters in this district are ordering pig iron in anticipation of needs further than one month. Sales aggregating 4250 tons held to the level of the preceding week. The largest single orders were for 500 tons for a central Ohio melter and 400 tons for an Indiana foundry.

St. Louis, April 15.—General conditions considered, shipments of pig iron in this district are making a decidedly good showing. The average daily rate of shipments of southern iron during the first two weeks of April was slightly above that of March,

(*Concluded on Page* 89)

Coke

Market Is Quieter and Prices Exhibit Easier Trend—Foundry Shipments Slightly Larger

PRICES of Connellsville beehive furnace coke are easier, as demand lags and surplus accumulates despite the low rate of production. Lower prices have been named for delivery into eastern districts. Contracting for second and third quarter is practically completed and makers are endeavoring to stabilize the spot market. Shipments to foundries show a moderate improvement.

Pittsburgh, April 15.—The market for beehive coke continues dull and easy, with slightly more surplus tonnage available. Spot sales of the furnace grade are slow and consist mainly of small lots. Producers are opposing lower prices, fearing the influence on third quarter contracts. The price generally continues $2.60. New contracting is practically complete, although some negotiations with gas producers still are under way. Foundry coke is in slightly better demand for small users, but business is relatively quiet and prices are steady.

Production of coke in the Connellsville region for the week ended April 5 was 32,240 tons, compared with 31,320 tons the preceding week and 72,850 tons in the same period a year ago, according to the *Connellsville Courier*.

Boston, April 15.—Continuance of cold weather has sustained demand for domestic coke and prices are firm. The situation in foundry coke is unchanged, foundries taking only contract quotas.

New York, April 15.—Beehive furnace coke prices are easier at $2.50 to $2.60, Connellsville, with demand sluggish. Beehive foundry coke prices are unchanged, but easy at $3.50 to $3.75, Connellsville, and $4.85 Latrobe. By-product coke is holding at $9.40, delivered, Newark; $11, New England, and $9, Philadelphia.

St. Louis, April 15.—New buying of metallurgical coke is in moderate volume and limited to immediate requirements. Shipments of foundry grades, however, are holding up well. Demand for industrial and domestic coke has decreased. Prices are unchanged.

Cincinnati, April 15.—The movement of by-product foundry coke fails to show improvement over March. Lowered prices on foundry grades have resulted in satisfactory spring ordering.

Birmingham, Ala., April 15.—Additional coke ovens have been lighted but are being operated slowly. Demand is steady. By-product foundry coke is unchanged at $5, base, Birmingham, the price prevailing for the past two years.

Coke Prices

Prices Per Net Ton

Beehive Ovens	
Connellsville furnace	$2.60
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25
By-Product Foundry	
Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit ovens	9.00
Philadelphia, del.	9.00

Ferroalloys

Spot Sales Small—Little Change in Specifications

New York, April 15.—Seven or eight carloads are noted in the spot spiegeleisen sales of the past week. Contract specifications are in steady volume. Domestic material, 19 to 21 per cent, is steady at $34, furnace, in carload lots, differentials applying to larger quantities. Ferromanganese is unchanged at $99, duty paid, tidewater, to users of carloads to 500 tons annually, with differentials on larger quantities.

Pittsburgh, April 15.—Ferroalloy demand shows little change since April 1, with shipments of most grades holding at the March rate. Little spot business is appearing. Prices continue $103.79, delivered, for small lots of ferromanganese and $34 for spiegeleisen. Tungsten remains quiet, ferrotungsten generally holding around $1.40. Prices of other alloys are unchanged with activity in most grades continuing at recent rates.

Bolts, Nuts, Rivets

Specifications Little Changed from March Rate

NUT AND BOLT PRICES, PAGE 74

Pittsburgh, April 15.—Specifications for bolts, nuts and rivets show little change from March and are below the usual seasonal volume. Demand is confined to early requirements, but is well distributed among various consumers. Prices continue 60 to 70 off for bolts and nuts, and 3.10c, Pittsburgh, for large rivets. Operations continue 60 to 65 per cent.

Cleveland, April 15.—Some betterment is noted in specifications against second quarter nut, bolt and rivet contracts. Consumers will accept only small shipments. Prices are unchanged and apparently firm.

Chicago, April 15.—Orders for bolts, nuts and rivets show little gain. Tonnage is running below a year ago. Producers are operating at 65 to 70 per cent. Bolts and nuts are quoted at 60 to 70 off list.

New Rate Schedules Due by Saturday

Washington, April 15.—With May 20 the effective date for new freight rates on iron and steel products east of the Mississippi and north of the Ohio and Potomac rivers on a mileage basis as prescribed by the interstate commerce commission in Docket No. 17,000, the carriers must file their new tariffs no later than April 19. Some are being filed today.

Originally the new rates were to be effective last Oct. 20, but several extensions were granted by the commission. It is said that the annual reduction in freight charges will be $2,500,000. The mileage scales—one for official territory and one for New England—on which the new rates will be based were given on page 1750 of IRON TRADE REVIEW of June 27, 1929.

Aproximately 6000 students have been enrolled and now are taking the correspondence course in general illumination being conducted by the Westinghouse Lighting institute, Grand Central Palace, New York. The course, which covers all phases of industrial lighting, was made available without cost to those interested in the subject.

Ferroalloy Prices

(In dollars, except Ferrochrome)

*Ferromanganese, 78 to 82 per cent tidewater, duty paid	$99.00
*Ferromanganese del. Pittsburgh	103.79
Spiegeleisen, 19 to 21 per cent, domestic furnace spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do, less carload	85.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.40 to 1.45
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one ton to carload	170.00
Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Scrap

Decline Continues as Buying Is Absent—Supply Not Enough to Burden—Melters Cautious

LOWER prices are being developed constantly in iron and steel scrap, succeeding sales usually being at lessened quotations. Chicago prices have been holding fairly well but are weakened by softness in other markets. In some centers prices remain nominally unchanged for lack of transactions to test them.

Chicago, April 15.—Recent weakness in outside scrap markets continues to have a depressing reflection here. Dealers are reluctant to sell forward tonnages. A mixed price situation is shown. Some prices are holding their own, while cast and specialty grades are easy. Consumer buying has declined in low phos. Heavy melting steel is holding at $13 to $13.50, with mills taking steady shipments and adding to reserve stocks. Rather marked recessions have developed in forge scrap and rail ends. Light forge flashings are $12.50, Kokomo, with a $2.40 freight rate to Chicago. Dealers are doing little trading.

Boston, April 15.—The situation in iron and steel scrap remains unchanged. There has been little buying, but the situation is relieved somewhat because not much material is offered by sellers. Inquiries are few and foundries are apparently not interested to any extent. Prices continue to hold in a limited range.

New York, April 15.—Further reductions are noted in iron and steel scrap, with sellers forcing such light business as is being done. With few

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 13.00
Boston, dealers	9.10 to 9.75
Buffalo, No. 1	14.00 to 14.50
Buffalo, No. 2	12.00 to 12.25
Chicago	13.00 to 13.50
Cincinnati, deal	11.50 to 12.00
Cleveland, No. 1	13.25 to 13.75
Cleveland, No. 2	12.50 to 13.00
Detroit, No. 1 deal.	11.75 to 12.25
Detroit, No. 2 deal.	10.00 to 10.50
East Pa., del. mill	14.00
N. Y. deal R. R.	10.00 to 10.50
N. Y. deal No. 2	8.00 to 8.50
N. Y., deal. yd.	7.25 to 7.50
Pittsburgh No. 1	15.75 to 16.25
St. Louis, No. 1 sel.	13.00 to 13.25
Federal, Ill.	12.50 to 12.75
Granite City, Ill.	11.50 to 12.00
Valleys, No. 1	16.00 to 16.50

COMPRESSED SHEETS

Buffalo (dealers)	12.00 to 12.50
Chicago	12.00 to 12.50
Cleveland	12.50 to 13.00
Detroit, dealers	11.25 to 11.75
E. Pa. new mat.	13.00
Pittsburgh	15.50 to 16.00
Valleys	15.50 to 16.00

BUNDLED SHEETS

Buffalo	9.50 to 10.00
Cincinnati, deal.	10.25 to 10.75
Cleveland	10.50 to 11.00
Eastern Pa.	11.50 to 12.00
Pittsburgh	14.00 to 14.50
St. Louis	9.00 to 9.50

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Detroit, dealers	8.50 to 9.00
St. Louis	9.00 to 9.50

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	8.50 to 9.75
Buffalo	17.50 to 18.00
Chicago (3 feet)	16.00 to 16.50
Chicago (2 feet)	16.50 to 17.00
Cincinnati, deal.	17.75 to 18.25
Detroit, dealers	15.50 to 16.00
Pittsburgh, (open-hearth, 3 ft. and less)	19.50 to 20.00
St. Louis	17.00 to 17.50

STOVE PLATE

Birmingham	10.00 to 11.00
Boston, consumers	10.50 to 11.00
Buffalo	11.75 to 12.00
Chicago, net	10.00 to 10.50
Cinn., deal. net	8.25 to 8.75
Detroit, net, deal.	9.00 to 9.50
Eastern Pa.	10.50 to 11.00
N. Y., deal., mill	7.50 to 8.00
St. Louis	11.00 to 11.50

COUPLERS, SPRINGS

Buffalo	18.25 to 18.75
Chicago	15.50 to 16.00
Eastern Pa.	19.50 to 20.50
Pittsburgh	19.50 to 20.00
St. Louis	14.00 to 14.50

ANGLE BARS—STEEL

Chicago	15.00 to 15.50
St. Louis	12.00 to 12.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	18.50 to 19.00
Cleve. billet and bloom crops	18.00 to 18.50
Eastern Pa.	20.00 to 21.00
Pitts. billet and bloom crops	21.50 to 22.00
Pitts. Sheet bar crops	20.50 to 21.50

FROGS, SWITCHES, GUARDS

Chicago	14.00 to 14.50
St. Louis	13.50 to 13.75

SHOVELING STEEL

Chicago	13.00 to 13.50
Cleveland	11.00 to 11.50
St. Louis	12.00 to 12.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.00 to 11.00
Boston, dealers	10.00 to 10.50
Buffalo, No. 1	11.50 to 12.00
Buffalo, No. 2	14.00 to 14.50
Chicago, No. 1	13.50 to 14.00
Chicago, No. 2	13.00 to 13.50
Cincinnati, No. 2	11.50 to 12.00
Eastern Pa.	15.50 to 16.00
N. Y., No. 1 deal.	11.75 to 12.00
Pittsburgh, No. 2	15.75 to 16.25
St. Louis, No. 1	11.00 to 11.25
St. Louis, No. 2	12.50 to 12.75

SPECIFICATION PIPE

Boston	8.50 to 9.00
Eastern Pa.	13.50 to 14.00
New York, deal.	9.25 to 9.75

BUSHELING

Buffalo, No. 1	12.00 to 12.50
Chicago, No. 1	11.00 to 11.50
Cinn., No. 1 deal.	10.00 to 10.50
Cinn., No. 2	6.50 to 7.00
Cleveland, No. 2	9.00 to 9.50
Detroit, No. 1 new deal.	10.50 to 11.00
St. Louis, No. 1	9.50 to 10.00
Valleys, new No. 1	15.00 to 15.50

MACHINE SHOP TURNINGS

Birmingham	7.00 to 8.00
Boston, dealers	5.50 to 6.00
Buffalo	9.00 to 9.50
Chicago	7.50 to 8.00
Cincinnati, deal.	7.75 to 8.25
Cleveland	9.00 to 9.50
Detroit	7.25 to 7.75
Eastern Pa.	10.50 to 11.00
New York, deal.	7.00
Pittsburgh	11.00 to 11.50
St. Louis	6.75 to 7.25
Valleys	11.25 to 11.75

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	5.25 to 5.60
Buffalo	11.00 to 11.25
Cincinnati, deal.	8.25 to 8.75
Cleveland	10.00 to 10.50
Detroit, dealers	8.00 to 8.25
Eastern Pa.	10.00 to 10.50
New York, deal.	6.50
Pittsburgh	10.50 to 11.00

CAST IRON BORINGS

Birmingham, chem.	12.00 to 13.00
Birmingham, plain	7.00 to 8.00
Boston, chem.	9.00 to 9.25
Boston, dealers	5.50 to 6.00
Buffalo	11.00 to 11.25
Chicago	9.25 to 9.75
Cincinnati, deal	8.25 to 8.75
Cleveland	9.50 to 10.00
Detroit, dealers	8.00 to 8.25
Eastern Pa.	10.50 to 11.00
Eastern Pa., chem.	14.00
New York, deal.	6.50 to 7.00
Pittsburgh	10.50 to 11.00
St. Louis	9.50 to 9.75

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	11.00 to 11.50
Chicago, net	10.75 to 11.25
Cincinnati,	9.00 to 9.50
Eastern Pa.	11.50 to 12.00
New York, deal.	7.75
St. Louis	10.25 to 10.50

FORGE FLASHINGS

Boston, dealers	8.50 to 9.00
Buffalo	12.50 to 12.75
Cleve. over 10 in.	11.25 to 11.75
Detroit	10.50 to 10.75

FORGE SCRAP

Boston, dealers	7.00 to 8.00
Chicago	16.50 to 17.00
Eastern Pa.	13.50

ARCH BARS AND TRANSOMS

Chicago, net	16.75 to 17.25
St. Louis	18.00 to 18.50

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	13.50 to 14.00
Chicago steelworks	10.50 to 11.00
Cleveland	12.00 to 12.50
Eastern Pa.	13.50
Pittsburgh	14.00 to 14.50
St. Louis	10.00 to 10.50

STEEL CAR AXLES

Birmingham	14.00 to 15.00
Boston, ship point	15.50 to 16.50
Buffalo	17.50 to 18.00
Chicago	17.90 to 18.50
Eastern Pa.	22.00 to 23.00
Pittsburgh	20.50 to 21.00
St. Louis	18.50 to 19.00

SHAFTING

Boston, ship point	14.00 to 14.50
Chicago	16.25 to 16.80
Eastern Pa.	19.00
New York, deal.	14.00 to 14.50
St. Louis	18.00 to 18.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.25 to 13.75
Buffalo, steel	18.00 to 18.50
Chicago, iron	14.50 to 15.00
Chi., rolled steel	16.25 to 16.75
Cincinnati	12.00 to 12.50
N. Y., iron, deal.	10.50 to 11.00
Pittsburgh iron	15.00 to 15.50
Pittsburgh, steel	19.50 to 20.00
St. Louis, iron	13.50 to 14.00
St. Louis, steel	16.00 to 16.50
East Pa. steel	19.50 to 20.50
East Pa. iron	15.00

NO. 1 CAST SCRAP

Birmingham, cup.	10.00 to 11.00
Buffalo	13.25 to 13.75
Boston, textile	12.50 to 13.50
Chicago, mach.	15.70 to 16.25
Chicago, railroad	14.60 to 15.10
Chicago, agri.	13.15 to 13.70
Cincinnati, mach. cupolas, gross	18.25 to 18.75
Cleveland, cupola	14.50 to 15.00
Detroit, net deal.	10.50 to 11.00
East Pa. cupola	15.50
N. Y. cup. deal.	10.85
N. Y., del. local foundries	15.00
Pittsburgh, cupola	15.00 to 16.00
San Fran., del.	13.50 to 14.00
Seattle	14.50 to 14.75
St. L. No. 1 mach.	14.50 to 15.00
St. Louis, No. 1	13.50 to 14.00

HEAVY CAST

Boston	10.50 to 11.00
Boston, mach. cast.	14.50 to 15.25
Buffalo, breakable	10.00 to 10.50
Cleve., breakable	10.50 to 11.00
Detroit, auto, net Dealers	12.00 to 12.50
Detroit, break. deal	8.00 to 8.50
Eastern Pa.	13.00 to 13.50
New York, deal.	9.75 to 10.50
Pittsburgh	11.50 to 12.00

MALLEABLE

Boston, railroad	16.00 to 16.50
Buffalo	17.00 to 17.50
Chicago, agri.	14.75 to 15.25
Chicago, railroad	16.50 to 17.00
Cinn., R. R. deal.	15.25 to 15.75
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail	17.00 to 17.50
Detroit, auto deal.	14.00 to 14.50
St. Louis, rail	14.00 to 14.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	13.00 to 14.00
Boston	10.75 to 11.00
Buffalo	14.00 to 14.50
Chicago	15.00 to 15.50
Eastern Pa.	15.50 to 16.00
New York	10.50 to 11.00
St. Louis	14.00 to 14.50

LOCOMOTIVE TIRES

Chicago, cut	16.50 to 17.00
St. Louis No. 1	13.75 to 14.25

LOW PHOS. PUNCHINGS

Chicago	14.50 to 15.00
Pittsburgh	18.50 to 19.50
Eastern Pa.	19.00

exceptions consuming purchases have been at a reduction. A Phillipsburg, N. J., consumer has closed on No. 1 heavy scrap at 50 cents a ton less than his previous purchase; a Florence, N. J., consumer has closed on heavy breakable at 50 cents less; a Harrisburg, Pa., consumer on skeleton steel at 50 cents less; a Bethlehem, Pa., and a Coatesville, Pa., consumer of mixed borings and turnings at a similar reduction. Other instances could be cited. Dealers are now paying $6 to $6.50, New York, on mixed borings and turnings; $7.25 to $7.50 on yard steel for eastern consumption; $7.50 to $8 on mill stove plate; and $10 to $10.50 for No. 1 railroad steel for eastern consumption. On the latter grade, however, dealers are paying $11 and $11.25, delivered barge, on shipments for Bridgeport, Conn., and Buffalo.

Buffalo, April 15.—Sales of No. 1 heavy melting steel have been made here at $14.50, a reduction of 75 cents a ton from the price last paid for this grade. Stove plate has been sold in tonnage at $12.50, delivered. Considerable scrap is being bought in Detroit for delivery here by boat as soon as ice conditions will permit. This is weakening the local market for several materials although no price changes have been recorded in actual sales.

Pittsburgh, April 15.—Iron and steel scrap is still in the doldrums with continued easy tone and lack of buying. Completion of deliveries on contracts is expected to stimulate demand soon, dependent on rate of melting. Occasional distress lots of heavy melting steel are offered at about $16 but the market is nominally unchanged at $15.75 to $16.25. Heavy cast is active at $12. Railroad specialties are lower and blast furnace grades dull.

Cleveland, April 15.—Iron and steel scrap shows little change. Shipments to mills continue restricted. Consumer sales are confined to small tonnages of heavy melting steel and machine shop turnings. The former was placed at $14.10 and the latter at $9.75. No. 2 busheling again is quoted lower at $9 to $9.50. Machine shop turnings and compressed sheets are fractionally higher. Both melters and brokers show reluctance in booking material at present prices.

Cincinnati, April 15.—Quotations on iron and steel scrap remain nominally unchanged with exception of a reduction in stove plate. The market remains dull. The Southern and Louisville & Nashville railroads offered normal scrap lists this week.

Detroit, April 15.—Dull conditions continue in iron and steel scrap, with quotations apparently at bottom. Dealers expect little change in the near future. Prices are nominally unchanged.

St. Louis, April 15.—Iron and steel scrap shows no improvement in demand, and further price declines were recorded on a number of important items. Consumers buy sparingly for prompt shipment. The low levels brought by recent declines have failed to stir investment buying. Consumer stocks are moderate and accumulations in yards are below the seasonal average. Railroad offerings and shipments have been liberal but not sufficient to cause distress material.

Birmingham, Ala., April 15.—No improvement in iron and steel scrap is seen and little tonnage is moving. Prices are unchanged. Heavy melting steel is slow at $10.50 to $13.

Toronto, Ont., April 15.—Interests in iron and steel scrap has fallen to listlessness. A few buyers placed contracts for future delivery during the week, but most sales are for spot shipment. Foundry interests and other consumers of iron scrap are buying steadily. Mills are buying only when special lines of steel scrap are required. Prices are firm, but unchanged.

Philadelphia, April 15.—A moderate business in No. 1 heavy melting steel at $14, delivered, which now represents the market, is noted this week. Otherwise scrap trading is small and the easy tone continues except steel axles which have moved up. Included last week was important business in blast furnace borings, turnings at $10, delivered.

Canadian Scrap

Dealers Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$19.00
Steel axles	17.00
Car wheels	14.50
Stove plate	12.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	9.00
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable (net)	11.50

Semifinished Steel

Specifications Show Moderate Increase —Prices Steady

SEMIFINISHED STEEL PRICES, PAGE 74

Pittsburgh, April 15.—Occasional spot sales of semifinished material comprise practically the only activity in the market. Consumers are placing little forward business, although shipments are increasing over the March rate. New business is reported at the full $33 price for rerolling billets, slabs and sheet bars. Forging billets are in slightly better demand with the market continuing $38. Wire rods are steady at $38. Skelp continues dull, with prices 1.80c to 1.85c, Pittsburgh.

Cleveland, April 15.—Sheet and strip mills are increasing specifications for semifinished steel moderately. The leading merchant producer here continues to operate 12 of its 14 open hearths. Prices are steady at $33, Cleveland and Youngstown, for sheet bars, billets and slabs.

Chicago, April 15.—A more spirited demand is noted for semifinished steel. Specifications have gained perceptibly in the past ten days. Shipments are active against second quarter contracts. Quotations for sheet bars and commercial or rerolling billets, 4 x 4-inch base, are $35, Chicago. Wire rods are $39, Chicago.

Philadelphia, April 15.—Billet specifications have increased considerably. Prices continue $33, base, Pittsburgh, for rerollers, and $38 for forging quality.

Operating Rates

District Rates Hold Former Gains— Finished Lines in Good Demand

Youngstown, O.—Despite a 5 per cent increase in the rate at Youngstown Sheet & Tube Co., mill operations are at 68 per cent, a loss of 2 points. Steel production of independents will be unchanged with 33 of the 51 open hearths going, more than half of which are at the Republic Steel Corp. plants. Bessemer output is at 60. Corporation steel making remains at 65 to 70. Independent sheet makers will have 93 of their 120 mills under power as compared with 95 last week. Strip is up 5 per cent and will average 85. Independent tin plate output is at 85 and that of the Corporation at 75. Pipe is slightly better but does not exceed 55. Independent and Corporation bar mills are at 65 and 70, respectively.

Cleveland—Percentage for the district's steel output is at 82. Steelmaking is at a higher level this week with 28 of 34 open hearths pouring, Corrigan, McKinney Steel Co. still operating 12. This company has curtailed pig iron production with schedules calling for three of its four stacks in blast. Otis Steel Co. has its plate mills at the Lakeside plant operating at practical capacity.

Buffalo—For the third consecutive week the district has held at 77 per cent, the high mark of the year in steel production. A slight gain in one big plant has been offset by a necessary readjustment of schedules in another, due to repairs. General steelworks are operating at higher rates than those specializing in one or a few materials.

Pittsburgh—The steady rate of 75 per cent of capacity for ingot production continues, having held this level since early February. Most finishing-mill schedules are unchanged, with sheets continuing 70 to 75 and tin plate at 85. Strip schedules are slightly heavier at 60 to 65 and pipe higher at 40 to 45.

Chicago—Ingot output remains at 90 per cent, unchanged from the past two months. Plate mills are now at near capacity and bar and structural activity is at about 85. Twenty-six of the 36 steelworks furnaces are active. Illinois Steel Co. has blown in No. 5 steelworks blast furnace at South Chicago, preparatory to taking out No. 1 furnace for relining. As No. 5 furnace is a remodeled and enlarged stack, net pig production at South works will thus be increased.

Bars

Better Demand Noted in Some Markets—Prices Show Some Weakness on Large Lots

IMPROVEMENT is noted in demand for soft steel bars, though it is not great. Chicago mills find sufficient increase in buying to be a gain, while Pittsburgh makers find their total sales slightly over those of March. Users are taking only immediate needs and forward buying has not been resumed. Minimum prices are being generally applied to most orders.

BAR PRICES, PAGE 73

Chicago, April 15.—More activity in alloy steel bars features the bar market. Increased tonnage for farm implement needs and the growing consumption of alloy bars for tractor building contributed to the gains, plus slightly heavier automotive and parts orders. Bar mills are operating above 85 per cent and producers are encouraged at the steady flow of specifications. Sales activity at the beginning of recent months indicates the short range character of buying, contrasted with former contracting generally for three-month requirements. Forward sales continue light. Analysis of March orders by one producer shows a gain of 15 to 18 per cent in bar specifications over February. Hay tool and harvester-thresher programs of implement works are promising, and apparently unaffected by recent weakness in grain market prices.

Soft steel bars are quoted at 1.90c to 2.00c, Chicago, with 1.90c regarded as the base. Rail steel bars to the manufacturing trade are being quoted at 1.80c, Chicago Heights.

New York, April 15.—Steel bar prices are firm at 1.80c to 1.85c, Pittsburgh. Specifications, while spotty, are more active than a fortnight ago. Deliveries range two to three weeks on the general run of business.

Philadelphia, April 15.—Steel bars continue 1.80c to 1.85c, base, Pittsburgh, and current specifications are comparatively slow.

Pittsburgh, April 15.—What change is noted in specifications for steel bars is for the better although the gain over March tonnage is moderate. Cold bar finishers are better buyers as a result of slightly improved demand from automotive sources. Orders continue in small lots with little anticipation of future requirements. Mill operations show little change. The market remains steady at 1.80c, Pittsburgh, on most tonnage, with 1.85c on small lots, although single carloads in instances recently have been taking the minimum price.

Cleveland, April 15.—Soft steel orders continue to run slightly ahead of the rate of March. This is due largely to automotive requirements which, however, are not as brisk as anticipated. Bolt, nuts and rivet makers are taking only small lots. Buyers generally are most conservative. Soft steel bars are generally 1.80c, base, Cleveland, with 1.80c delivered on attractive lots.

Refund To Heppenstall

Washington, April 15.—The treasury department has announced a refund to the Heppenstall Co., formerly the Heppenstall Forge & Knife Co., Pittsburgh, amounting to about $127,000, as overassessments of income and profits taxes as follows: For 1917, $101,694.99; for 1919, $22,606.81 and for 1920, $4,697.14.

Comments on Economies

Pertinent observation on many phases of present day economic and industrial conditions are given by Ellison J. Thompson, president, Thompson Electric Co., Cleveland, in a booklet entitled, "The Relation of Production Consumption and Buying Powers to Supply and Demand."

Plans Building Program

The organization of a definite program for the development of building, representing all the interests in the construction industry, will be undertaken by the National Building Survey conference, of which Fenton C. Turck Jr., Washington, is chairman. The conference is attempting to stimulate building as one means of general industrial activity at this time.

Plates

Market Is Quieter—Delivery Dates Lengthening in Middle West—Car Requirements Active

PLATE demands continue to increase in the Chicago district, where deliveries now are obtained with difficulty in less than 30 days, but elsewhere current business is not equal to the volume of recent weeks. Miscellaneous tank work is smaller. New extras for cutting of sketches have been announced in the Pittsburgh district. Cleveland books small orders.

PLATE PRICES, PAGE 73

Chicago, April 15.—With the continued expansion of plate deliveries, buyers are finding it difficult to obtain shipping accommodations on most sizes inside of 30 days. The delivery range for universal and sheared plates is about four to six weeks. Car shop specifications are continuing at about 4000 to 5000 tons weekly. About 1000 tons have been added to tank plate inquiry, making the total from the oil country in excess of 20,000 tons. Miscellaneous tank orders during the week totaled about 1000 tons. While the preliminary negotiations have been completed for the 25,000-ton Texas-Chicago natural gas line, information from Houston, Tex., indicates financing arrangements are incomplete. Plate sales are on the basis of 1.90c, Chicago.

New York, April 15.—Plates are unchanged at 1.85c to 1.90c, Coatesville, although the bulk of tonnage is going at the higher figure. Some sellers report an improvement in business. New railroad and ship work continues to lag and miscellaneous fabricated plate work is at the lowest ebb in many months.

Pittsburgh, April 15.—A new card of extras has been announced on plates changing the extras on the cutting of sketches. The new card is a simplification of the old schedule, eliminating extras formerly included for scrap waste in the cutting of sketches. Plate business shows little change from activity of either early April or March. Barge inquiry is fairly active and some work that had been postponed recently is expected to come up for bids shortly. The plate market generally is 1.80c, Pittsburgh, with 1.85c finding little application. Large users better this level.

Cleveland, April 15.—Only small tonnages are noted among recent plate specifications. They come from widely diverse consuming lines. The Allied Oil Co., Cincinnati, placed two lots of tanks, 955 tons for Cleveland and 416 tons for Buffalo, with McClintic-Marshall Co. The 1400 tons for the Ingersoll road pipe line for Cleveland, will be rolled by the Otis Steel Co. Plates to most users are 1.80c, Pittsburgh, but large tonnage buyers are reported to shade this level.

Philadelphia, April 15.—Plate prices continue 1.90c, base, Coatesville, with exceptions on especially attractive

business. The exceptions comprise a small percentage of current sales.

CONTRACTS PLACED

1400 tons, Ingersoll road water main, Cleveland, to Biggs Boiler Works Co.; plates from Otis Steel Co.
955 tons, oil tank storage at Cleveland for Allied Oil Co., Cincinnati, to McClintic-Marshall Co.
416 tons, oil tank storage at Buffalo, for Allied Oil Co., Cincinnati, to McClintic-Marshall Co.
100 tons, 150,000-gallon steel tank and tower, Southgate, Calif., to Chicago Bridge & Iron Works.
Indefinite tonnage, eight gas holders for California Gas Co., to Western Pipe & Steel Co.

CONTRACTS PENDING

365 tons, 30-inch welded pipe line, Everett, Wash. Bids April 14.

Steel Bookings Rise

New York, April 15.—United States Steel Coorp. again showed an increase in its unfilled tonnage, the rise for March being the seventh consecutive one. With an increase of 90,905 tons at 2.03 per cent, the total of orders left on the books was 4,570,653 tons. This latter figure is a high for several years, being next to the 4,882-739 tons of January, 1926. Following are monthly figures.

Date	Total	Change, tonnage	Change, per cent	
Mar. 31, 1930	4,570,653	90,905	+ 2.03	+
Feb. 28, 1930	4,479,748	11,038	+ 0.25	+
Jan. 31, 1930	4,468,710	51,517	+ 1.2	+
Dec. 31, 1929	4,417,193	291,848	+ 7.74	+
Nov. 30, 1929	4,125,345	38,783	+ 0.95	+
Oct. 31, 1929	4,086,562	183,981	+ 4.71	+
Sept. 30, 1929	3,902,581	244,370	+ 6.68	+
Aug. 31, 1929	3,658,211	429,966	—10.5	—
July 31, 1929	4,088,177	168,733	— 3.9	—
June 30, 1929	4,256,910	47,257	— 1.10	—
May 31, 1929	4,304,167	123,596	— 2.88	—
Apr. 30, 1929	4,427,763	17,045	+ 0.38	+
Mar. 31, 1929	4,410,718	266,377	+ 5.70	+
Feb. 28, 1929	4,144,341	34,854	+ 0.84	+
Jan. 31, 1929	4,109,487	132,775	+ 3.34	+
Dec. 31, 1928	3,976,712	303,712	+ 8.25	+
Nov. 30, 1928	3,673,000	78,030	— 2.80	—
Oct. 31, 1928	3,751,030	52,662	+ 1.42	+
Sept. 30, 1928	3,698,368	74,325	+ 2.05	+
Aug. 31, 1928	3,629,042	53,116	+ 1.40	+
July 31, 1928	3,570,927	66,082	— 1.81	+
June 30, 1928	3,637,009	220,187	+ 6.45	+
May 31, 1928	3,416,822	455,311	—11.70	—
Apr. 30, 1928	3,872,133	468,073	—10.70	—
Mar. 31, 1928	4,335,206	62,983	— 1.43	—
Feb. 29, 1928	4,398,189	122,242	+ 2.80	+
Jan. 31, 1928	4,275,947	303,073	+ 7.62	+

Manganese Duty Raised

Washington, April 15.—Conferees of the house and senate, ironing out differences in the tariff bill, have agreed upon a duty of 1 cent a pound on manganese ore in excess of 10 per cent manganese content. The present law provides for a duty of 1 cent a pound in excess of 30 per cent manganese content.

Pittsburgh Tube Co.'s new pipe plant at Monaca, Pa., is rapidly nearing completion. Its head office is located in the Vandergrift building, Pittsburgh.

Pipe

Utility Buying Wanes—Brooklyn, N. Y., Buys 2400 Tons—Steel Pipe Demand Only Fair

COMPLETION of public utility buying and the holding up of municipal purchases on account of slow-moving assessment bonds create a more quiet market. Brooklyn, N. Y., divided 2400 tons two ways; Akron, O., awarded 1500 tons, and Toledo, O., purchased 600 tons additional. Santa Ana, Calif., has 617 tons up. Magnolia Petroleum Co. is considering a 3-inch steel line in Texas.

PIPE PRICES, PAGE 74

New York, April 15.—The department of water supply, gas and electricity has bought 2400 tons of 8, 12 and 20-inch cast pipe for Brooklyn, N. Y. from two foundries. The low bid on unlined pipe was $42.60. About 1750 tons of special castings and fittings for Brooklyn also has been placed. New York is expected to place several thousand more tons of cast pipe during the next few weeks. Prices are firm. Scattered carload lots are fairly numerous. Small tonnages were ordered by Whitman, Mass., 6 and 8-inch, and by New Freedom, Pa., 4 and 6-inch. About 100 tons of 4 and 8-inch also was sold for export. One foundry has started shipping against orders placed by New York a month ago. The bulk of public utility buying has been completed. The volume compared favorably with other years.

Pittsburgh, April 15.—Demand for standard pipe is little changed although some signs are appearing of seasonal improvement in this material. Oil country requirements of tubular products continue slow with no increase shown since a month ago. Additional awards are lacking in line pipe, although considerable tonnage is involved in pending work that will be closed soon. Magnolia Petroleum Co. is considering the laying of a 3-inch gasoline pipe line from Fort Worth to Dallas, Tex. Pipe mill operations are slightly higher at 40 to 45 per cent.

Cleveland, April 15.—Buttweld pipe is slightly more active. Some jobbers have had to reorder. While large building projects are more or less at a standstill in this vicinity, small structures are going ahead and house building is progressing well which brings a drain upon jobber stocks. Plumbers and mill supply houses order small amounts as needed, receiving shipments within 24 hours.

Chicago, April 15.—Orders for cast pressure pipe are making moderate gains, although municipal buying is held back by the slow movement of special assessment bonds. Milwaukee took bids on 2100 tons of 6 and 8-inch; Akron, O., is awarding 1500 tons of 6 to 16-inch, a part being centrifugal. About 650 tons of this came to a producer in this territory. The county sanitary engineering department at Toledo, O., completed its award of 1100 tons of 6 and 8-inch cast pipe. Private orders in one to several carloads each are numerous. Prices remain steady on the basis of $37 to $38, Birmingham, and $45.20 to $46.20, delivered Chicago.

Birmingham, Ala., April 15.—Lettings for cast pipe were less active last week. Order books are heavy, however, and high production must be maintained to make prompt deliveries. Most shops operate on a 5-day week schedule. Further specifications are in sight including a few from southern points. Soil pipe production is a little better than it has been though the market still is considered slow.

CONTRACTS PLACED

2400 tons, 8, 12 and 20-inch cast pipe, for department of water supply, gas and electricity, Brooklyn, N. Y.; 1500 tons lined pipe to United States Pipe & Foundry Co. at $47.20; 900 tons unlined pipe to Donaldson Iron Works at $42.60.
650 tons, cast pipe, of the 1500-ton inquiry of 6 to 16-inch centrifugal and sand cast pipe for Akron, O., to James B. Clow & Sons.
600 tons, 6 and 8-inch pipe for county sanitary engineer, Toledo, O., to James B. Clow & Sons, in addition to previous award of 500 tons.
350 tons, 6, 8 and 10-inch pipe for Neenah, Wis., to James B. Clow & Sons.
325 tons, 8 and 12-inch class B cast pipe, Twenty-ninth avenue N. W., water extension, Seattle, to French manufacturers, through Argentieri & Colorossi.
300 tons, 4 to 10-inch class 150 cast pipe, Bear Gulch Water Co., Menlo Park, Calif., to American Cast Iron Pipe Co.
200 tons, 6-inch cast pipe for Yonkers, N. Y., to Warren Foundry & Pipe Co., at $39.80.
150 tons, 6 inch cast pipe for Bloomfield, N. J., to Warren Foundry & Pipe Co.
102½ tons, including 77¼ tons of 6-inch cast pipe and 25 tons of 8-inch class C, for Two Rivers, Wis., to Traverse City Iron Works, Traverse City, Mich.
Unstated tonnage, 6 and 8-inch cast pipe for Whitman, Mass., to an eastern foundry.
Unstated tonnage, 4 and 6-inch cast pipe for New Freedom, Pa., to an eastern foundry.

CONTRACTS PENDING

30,000 feet, 4 to 8-inch cast pipe for Geneva, O.
16,000 feet, 4 and 6-inch cast pipe for Clio, Mich.
2100 tons, 6 and 8-inch cast pipe for Milwaukee; bids in.
617 tons cast pipe, Santa Ana, Calif.; bids opened.
440 tons, 16 and 20-inch cast iron pipe for Brooklyn, N. Y., contractor's letting; bids in.

In 1805, Joseph McClurg, Joseph Smith and John Gormley built the "Pittsburgh Foundry," the first suc-

cessful foundry in the city of Pittsburgh, on ground now occupied by the Park building.

Tin Plate

Heavier Specifications Expected Soon For June Shipments

TIN PLATE PRICES, PAGE 74

Pittsburgh, April 15.—Activity in tin plate is steady but no further improvement is noted in specifications or operations. Specifications remain in fair volume but leading canmakers are not pressing for delivery. Weather conditions over the next four to five weeks will have an important bearing on some of the fruits packs. Heavier specifications are expected shortly as instructions for June shipments fall due. Tin plate continues $5.25 per 100-pound base box, Pittsburgh.

Iron Ore

About 500,000 Tons Pending in Open Market—Requirements Indefinite

IRON ORE PRICES, PAGE 74

Cleveland, April 15.—Consumers of Lake Superior iron ore still are uncertain concerning requirements for this season and the market gives indications of continuing quiet for several weeks. Not more than 500,000 tons is being figured in the open market, and buyers are in no haste to close. Producers say there is no doubt about last year's prices holding for all new business and as the basis for term contracts. Shipments from upper lake ports have not started but fleets are preparing to move within a week or two. The Cleveland-Cliffs Iron Co.'s fleet will have an additional boat this season through purchase of the H. F. BLACK from the Donner Steamship Co., of Buffalo. This vessel is of 9500 tons capacity. The Cleveland-Cliffs fleet now includes 22 boats.

Directs from Youngstown

Youngstown O., April 15.—With the Republic Steel Corp. merger definitely in effect, and new officials announced, operation of the various units of this corporation, in the Mahoning valley, and at Canton, Massillon, Pittsburgh, Buffalo, Birmingham, Cleveland and Chicago, will be directed from Youngstown. Republic forces at Youngstown will be enlarged considerably.

Effective standards for testing magnetic permeameters have been compiled by the bureau of standards and have been recorded, together with the methods of testing in research paper No. 140 issued by the bureau titled "Standards for Testing Magnetic Permeameters," by Raymond L. Sanford, physicist. Copies can be obtained from the superintendent of documents, Washington, for 5 cents.

Sheets

Miscellaneous Requirements Are Holding Up—Slight Increase Noted in Automotive Tonnage

MODERATE increase in current sheet business is noted in the Pittsburgh district, while at Chicago specifications and spot sales are fairly brisk. The gain in automotive tonnage is limited mainly to requirements of the Ford Motor Co., and the general volume of business still is below the seasonal average. An easier tendency in prices is noted in some districts.

SHEET PRICES, PAGE 73

Pittsburgh, April 15.—Incoming sheet business shows further moderate increase. Specifications for automotive material are gaining, although the bulk of the improvement is coming from the leading interest. Demand from other consuming lines is holding its recent gains, with a further upturn in a few instances. Aggregate automotive tonnage still is well below the usual seasonal volume and prevents mills from maintaining better than the current operating rate of 70 to 75 per cent. Prices show a fairly steady tone, with black sheets generally 2.65c, Pittsburgh, and galvanized 3.30c. Tin mill black remains 2.80c to 2.90c, and blue annealed 2.25c and 2.10c for 13-gage and 9 and 10-gage, respectively. Autobody sheets hold at 3.80c.

New York, April 15.—Sheets have developed further weakness. While the range on galvanized continues 3.25c to 3.30c, Pittsburgh, the price now is nearer the lower figure. Black sheets are 2.60c to 2.65c, Pittsburgh, but 2.60c is more representative. Blue annealed sheets are 2.00c to 2.10c, Pittsburgh, and blue annealed plates 2.15c to 2.25c. Demand generally is maintained at the March rate.

Buffalo, April 15.—Demand for sheets is improving, mills operating above 85 per cent of capacity. Strongly competitive prices continue to disturb the black sheet market. Special grades are firmer.

Youngstown, O., April 15.—Another lull is noted in new sheet business, though operations remain about as last week. Some mills are operating at 50 per cent, others at 85 per cent, and still others between these extremes. Recent rumors of large sheet orders placed here by various automotive interests are unverified. Makers of steel barrels are working on greatly reduced order books. Some plants in northern Ohio are closed down. Common black sheets generally are 2.65c, Pittsburgh; autobody sheets 3.80c; blue annealed 2.10c for Nos. 9 and 10 gages, and 2.25c for No. 13; and galvanized 3.30c.

Cleveland, April 15.—Some sheet mills note an increase in specifications from makers of automobile parts. Steel barrel manufacturers have enough material on hand for the present. Metal furniture producers and other users of highly finished sheets are doing well. Vitreous enameling stock is moving actively. A price of 2.55c, Pittsburgh, appears from time to time on black sheets, and lower than 3.30c is being done on galvanized. The 3.80c price holds on full finished, and 3.90c on metal furniture. Blue annealed sheets are quoted at 2.10c to 2.25c by jobbing mills; continuous mills naming lower figures.

Cincinnati, April 15.—Operations at sheet mills continue at about 60 per cent, with new orders showing good seasonal volume. Automotive tonnage remains light.

Chicago, April 15.—Fairly brisk specifications and active spot buying are reported in sheets, while operations in the district remain at 80 to 85 per cent. Deliveries are two to three weeks. Blue annealed demand continues steady. Mill quotations are 2.75c for No. 24 black; 3.40c to 3.50c for No. 24 gage galvanized; 2.20c for No. 10 gage and 2.35c for No. 13 gage blue annealed.

St. Louis, April 15.—Sheet business is maintaining the average of the past few weeks. Releases by the automotive industry are not up to expectations. The general manufacturing trade is taking heavier tonnages. Prices are steady.

Philadelphia, April 15.—The sheet market is easier. Blue annealed continue 2.10c and 2.25c, base, Pittsburgh, except on widths and gages in which strip sheet is competitive. Black sheets now are 2.60c to 2.65c, base, Pittsburgh, while lower prices are being done on highly finished material taking extras. Galvanized sheets have eased off to 3.25c to 3.30c.

Gear Shipments Heavier

April shipping schedules of the Warner Gear Co., subsidiary of Borg-Warner Corp., Chicago, are 10 per cent larger than shipments in April, last year, according to C. S. Davis, president of Borg-Warner Corp. He added that present indications point to a continuation of the present month's trend.

Crucible Steel Co. of America, New York, has been granted refunds by the bureau of internal revenue for overassessment of income taxes as follows; for 1917, $34,344.05; for 1928, $31,596.82.

Structural Shapes

Bridges, Schools Vie for First Place—One Office Building Noses Out Both Classes—Plain Material Price Shows Some Weakness

APPROXIMATELY one-fourth of the 42,885-ton aggregate of awards last week is represented by one structure, an 11,500-ton office building at Pittsburgh. The remainder is made up of 17 or more bridge items, topped by a 2300-ton bridge in New York, and 16 or more schools taking 100 to 1000 tons at a time. A 2500-ton subway was let in Philadelphia and a 3200-ton tunnel again is up at New York. The latter also requires 30,000 tons of cast iron segments. A 7000-ton power plant at Kansas City, Mo., a 6000-ton office building at Philadelphia, a 3000-ton high school at Queens, N. Y., a 2500-ton state building at Hartford, Conn., three lots of transmission towers aggregating 6600 tons, and track elevation work at Dayton, O., 8000 tons, are among large inquiries.

STRUCTURAL SHAPE PRICES, PAGE 73

New York, April 15.—Structural shape lettings are mostly in small tonnages, awards between 200 and 300 tons each being quite numerous. Tonnage placed since April 1 is running slightly heavier than last month. The tunnel under East river calling for 3200 tons of shapes and 30,000 tons of cast iron segments is being readvertised. Jobs up for figures represent a large volume but buyers are slow to close on large work. The money market is more favorable for semi-speculative building and several projects, held up for financing, are about to go ahead. Prices are easier on attractive tonnages, 2.045c, New York, being shaded. Most of the smaller fabricators are busier with better backlogs.

The Steingut bill, signed by Governor Roosevelt at Albany, authorizing the board of transportation to plan and construct tunnels between New York boroughs and New Jersey, will rush construction of the Narrows tunnel and the East River tube at East Thirty-eighth street. Other assembly bills call for re-organization of the port authority with the bridge and tunnel commission. This should bring earlier action on Hudson river tunnel plans. Similar bills are being offered with no apparent opposition in New Jersey.

Boston, April 15.—Less than 500 tons represented total shape awards here last week. A dormitory at Massachusetts Institute of Technology, 175 tons, went to Boston Structural Steel Co., while a 170-ton plant for Boston Varnish Co., Everett, Mass. was awarded New England Structural Co. Pending work is light.

Philadelphia, April 15.—Plain shape demand continues to lag and the price situation continues easy. Plain standard shapes are 1.75c to 1.85c, base, eastern mill, with even loweer done on particularly attractive tonnages.

Pittsburgh, April 15.—The structural market is quiet in this district, both awards and inquiries being less active. Pending work involves few large individual projects. Specifications for plain material show little change over the past several weeks but remain in fair seasonal volume. Prices are unchanged; 1.80c, Pittsburgh, generally represents the market but preferred consumers do better.

Buffalo, April 15.—Structural demand, dull for this season, shows signs of early improvement. Fabricators have small order books for April. A 200-ton lot will be purchased by a Buffalo contractor for a hotel job. No new tonnage of importance is up and no large awards are noted.

Cleveland, April 15.—Only small jobs are reaching the award stage, action on larger work being indefinitely deferred. It is expected, however, that the 18,000-ton Central-Lorain bridge will be let in June. A new post office, a department store and the Cleveland hotel addition, all in the Union Terminal group, will probably reach fabricators before the second half is well along, accounting for possibly more than 25,000 tons. Plain material is quoted 1.80c, Pittsburgh, with lower levels available on large lots.

Chicago, April 15.—Structural material deliveries are three to five weeks, with mill operations now close to 85 per cent for the district. Numerous railroad and highway bridge projects again are reported, while industrial and public works construction in this territory helps to take up the slack of slow commercial and residential building. Fresh inquiries amount to about 9000 tons, the largest being 7000 tons for the Kansas City Power & Light Co. power plant at Kansas City, Mo. The price of 1.90c, Chicago, is named as base for plain material.

Birmingham, Ala., April 15.—Fabricating shops are busy. All have received orders for highway bridges in Alabama and Tennessee, most for less than 100 tons apiece. Virginia Bridge & Iron Co. was awarded a 300-ton bridge for Morgan county, Tennessee.

Awards Compared

	Tons
Awards this week	42,885
*Awards last week	24,020
Awards two weeks ago	25,617
Awards this week in 1929	52,366
Average weekly awards, 1930	32,354
Average weekly awards, 1929	38,603
Average weekly awards, Mar.	27,797
Total awards to date, 1929	673,831
Total awards to date, 1930	517,670

*Revised

CONTRACTS PLACED

11,500 tons, Gulf building, Pittsburgh, to McClintic-Marshall Co., through Mellon-Stuart Co., general contractor.

3100 tons, building, Washington, to American Bridge Co.

2800 tons, transmission towers for Louisville Gas & Electricity Co., 2450 tons to Bates Expanded Steel Truss Co., and 350 tons to Louisville Bridge Co.

2500 tons, Ridge avenue subway, Philadelphia, to American Bridge Co.

2300 tons, viaduct, upper roadway, Queensboro bridge, New York, to McClintic-Marshall Co., through Bersin & Romm Engineering Co., general contractor.

2000 tons, Pennington avenue bridge, Baltimore, to Bethlehem Steel Co. and not 1700 tons to American Bridge Co. as reported in IRON TRADE REVIEW of April 3.

2000 tons, addition to Bloomingdale store, New York, to Hay Foundry & Iron Works.

1500 tons, hospital buildings, Brentwood, Long Island, N. Y., to Lehigh Structural Steel Co.

1000 tons, public school 144, Forest Hills, Queens, N. Y., to Easton Structural Steel Co.

900 tons, post office, Scranton, Pa., to Lehigh Structural Steel Co.

750 tons, Baltimore & Ohio railroad bridge, Laughlin Junction, Pa., to McClintic-Marshall Co.

700 tons, high school, Lynn, Mass., to Boston Structural Steel Co. Inc.

700 tons, school for social research, West Twelfth street, New York, to Taylor-Fichter Steel Construction Co.

600 tons, terminal, Mississippi Valley Barge Line, Cincinnati, to Wheeling Structural Steel Co.

600 tons, power house, Bagnell, Mo., to Mississippi Valley Structural Steel Co.

600 tons, transmission towers for Wisconsin Power & Light Co., Sheboygan, Wis., to American Bridge Co.

550 tons highway bridge, Moscow, Iowa, to Clinton Bridge Co.

545 tons, Mississippi river bridge, Topeka, Minn., to Minneapolis Bridge Co.

500 tons, parochial school, Lawrence avenue, Bronx, N. Y., to Buckingham Steel Co.

500 tons, junior high school, Philadelphia, to Robinson Iron & Steel Co., through Ralph Hertzog, general contractor.

500 tons, apartment, Grand and Broome streets, New York, to Dreier Iron Works.

500 tons, tractor assembly building, Caterpillar Tractor Co., Peoria, Ill., to the Austin Co.

400 tons, bridge and coal pocket shed, Jersey City, N. J., to Shoemaker Bridge Co.

400 tons, bridge work for Chicago, Milwaukee, St. Paul & Pacific railroad, to American Bridge Co.

300 tons, Van Horne school, Springfield, Mass., to Providence Iron & Steel Co., through L. S. Wood, general contractor.

300 tons, state highway bridge in Morgan county, Tenn., to Virginia Bridge & Iron Co.

300 tons, ship loading platform, State Harbor commission, San Francisco, to Herrick Iron Works.

300 tons, bridge at Evarts, Vt., for Central Vermont railroad, to American Bridge Co.

300 tons, addition to public school No. 22, Staten Island, N. Y., to Bethlehem Fabricators Inc.

290 tons, car and machine shop, Chicago, South

Shore & South Bend railroad, Michigan City, Ind., to Duffin Iron Co.

275 tons, Loughran apartments, Clearview street, Philadelphia, to Jones & Laughlin Steel Corp.

260 tons, vocational building, Amsterdam avenue, New York, to Lehigh Structural Steel Co.

260 tons, boiler house addition, South Charleston, W. Va., to Pittsburgh-Des-Moines Steel Co.

250 tons, building and crane runway, Heppenstall Forge Co., Bridgeport, Conn., to Porcupine Co.

250 tons, building, Standard Brands Inc., Peekskill, N. Y., to McClintic-Marshall Co.

250 tons, school, New Rochelle, N. Y., to Just Engineering Co.

250 tons, hospital, Cornwall, N. Y., to Belmont Iron Works.

250 tons, three hammerhead cranes for the government at Mare Island, Calif., to Dyer Bros.

210 tons, garage, Orange street, Brooklyn, N. Y., to Berkshire Structural Steel Co.

210 tons, Child's Educational Foundation building, East Eighty-fourth street, New York, to Easton Structural Steel Co.

200 tons, bridge, Boston & Maine railroad, Valley Falls, N. Y., to Phoenix Bridge Co.

200 tons, high school, South Norwalk, Conn., to V. W. Tarney.

200 tons, theater, Lynchburg Theatre Corp., Lynchburg, Va., to Virginia Bridge & Iron Co.

200 tons, Y. M. H. A. building, Baltimore, to Dietrich Bros.

175 tons, dormitory, Massachusetts Institute of Technology, Boston, to Boston Structural Steel Co.

170 tons, plant, Boston Varnish Co., Everett, Mass., to New England Structural Co.

160 tons, school, Yonkers, N. Y., to Kues Bros. Iron Works.

150 tons, viaduct over Steiner creek for Southern Pacific Co., San Francisco, to Dyer Bros.

150 tons, grade separation for Pacific Electric Railway, at Muscat, Calif., to Consolidated Steel Corp.

150 tons, two bridges for provincial government across Eel river at Meductic and near Hillsboro, N. B., to cost $37,000 each, to St. John Dry Dock & Shipbuilding Co., St. John, N. B.

140 tons, four state bridges in Maine, to McClintic-Marshall Co.

130 tons, Y. M. C. A. building, Stamford, Conn., to Easton Bridge & Structural Co.

125 tons, high school, Beaver Falls, Pa., to Jones & Laughlin Steel Corp.

120 tons, school, Tucson, Ariz., to El Paso Bridge Co.

110 tons, addition, Charity hospital, Cleveland, to National Iron & Wire Co.

105 tons, Owyhee project, Nyssa, Oreg., to unnamed interest.

100 tons, stores and offices, Torrington, Conn., to Wilcox Engineering Co.

100 tons, Little river bridge, Oconto, Wis., to Worden-Allen Co.

100 tons, synagogue, Hebrew Benevolent congregation, Atlanta, Ga., to Decatur Iron & Steel Co.

100 tons, reptile house, National Zoological park, Washington, to Pennsylvania Fabrication Co.

CONTRACTS PENDING

8000 tons, track elevation, Dayton Union Terminal Co., Dayton, O.

7000 tons, building for Kansas City Power & Light Co., Kansas City, Mo.

7000 tons, 1930 bridge requirements, Atchison, Topeka & Santa Fe railroad.

6000 tons, addition, Penn Mutual office building, Philadelphia.

3500 tons, 782 transmission towers, Superpower Co. of Illinois.

3200 tons, subway, route 103, section 4, East River tunnel, Manhattan-Brooklyn; also 30,000 tons of cast iron segments; being readvertised.

3200 tons, addition to department of agriculture building, Washington.

3000 tons, junior high school, borough of Queens, N. Y.

2800 tons, plant, Toledo Scale Co., Toledo, O.

2750 tons, shapes and plates, Pacific Fruit Express Co., San Francisco; bids being taken.

2500 tons, state office building, Hartford, Conn.

2000 tons, building, Merchants' National bank, Battle Creek, Mich.

1800 tons, 461 transmission towers, Byllesby Engineering & Management Corp., for Louisville-Colorado line.

1600 tons, apartments, East Seventy-seventh and East Seventy-eighth streets, New York.

1300 tons, 303 transmission towers, Superpower Co. of Illinois, for Kewanee-Dixon line.

1270 tons, Warner Bros. theater, Youngstown, O.

1200 tons, Y. M. C. A. building, Akron, O.; general contract to Clemmer & Johnson Co., Akron, O.

1000 tons, bridge, Fort Worth, Tex.

1000 tons, two bridges, Ashland and Hartsville, Ky.

1000 tons, DeVilbiss high school, Toledo, O.

1000 tons, Shaker Heights, O., high school.

1000 tons, chemical plant, Shell Oil Co., San Francisco; bids being taken.

900 tons, Union station, Tulsa, Okla.

750 tons, physical education building, Toledo university, Toledo, O.

600 tons, highway bridge work in Illinois; bids in.

500 tons, administration building, Century of Progress Exposition, Grant Park, Chicago.

450 tons, railroad shops at Indianapolis for Big Four railroad.

450 tons, Magnin's store, Oakland, Calif.; bids April 15.

400 tons, shop and fine arts building, Rensselaer Polytechnic institute, Troy, N. Y.; let to unstated general contractor.

400 tons, state highway bridges in New Jersey

300 tons, state highway bridges in New York.

300 tons, library, Ohio university, Athens, O.

200 tons, addition, Green Brier hotel, White Sulphur Springs, W. Va.; general contract to John W. Cowper Co., Buffalo.

Unstated tonnage, 4-story publishing house to cost $2,750,000, Lafayette and Second avenues, Detroit; A. Kahn, architect, drawing plans.

Concrete Bars

Small Work Active—2000-ton Hospital Let—Prices Weak on Large Quantities

HOSPITAL buildings awarded at Brentwood, N. Y., placed a 2000-ton order on Pittsburgh maker's books. Otherwise large work apparently is held up, several 1000 to 1400-ton jobs being pending in New York and Chicago. A seawall in Texas, 2400 tons, was awarded to Laclede Steel Co., St. Louis. Prices show weakness on large lots but are fairly firm on small quantities.

REINFORCING BAR PRICES, PAGE 73

New York, April 15.—Concrete reinforcing bars are fairly firm at 2.54c, New York, although some shading is reported on attractive business. Several jobs involving close to 1000 tons each are pending. New subways will take more than 1200 tons, and bids on several sections are to be opened within the next two weeks. Small lot shipments hold well and highway work also is taking a fair tonnage. National Bridge Co. will furnish the bars for the new Waldorf-Astoria hotel.

Boston, April 15.—In addition to 400 tons of concrete bars for a branch exchange building here for New England Telephone & Telegraph Co., about 400 tons in small jobs was let. The outlook for the next few weeks is bright because of the number of projects, mostly small, pending.

Chicago, April 15.—Bids for Illinois road work, 140 miles, were tabulated and 1400 to 1500 tons of reinforcing bars will be awarded shortly. Bids also are being received for the general contract for the administration building of the Century of Progress exposition for Chicago, and plans for a small amount of reinforcing bar work will soon be out. The World's Fair commission is to specify bar joists for floors and structural steel so that the building may be easily salvaged. Industrial building continues active despite the slump in office and residential building. Rail steel bars for reinforcing are quoted at 1.70c to 1.75c.

Pittsburgh, April 15.—Incoming concrete bar tonnage is well maintained, with a small gain shown over March activity. Orders mainly are made up of small lots. Most large tonnages in this district have been placed. Prices are irregular, with shading fairly frequent from general prices of 2.10c, Pittsburgh, for cut lengths, and 1.85c for stock lengths.

Buffalo, April 15.—John W. Cowper Co., local general contractor, will buy 565 tons of reinforcing bars for a hotel project in West Virginia. Road builders are figuring several jobs on which contracts were awarded recently and will begin covering mesh requirements in the near future. Signs point to an improved second quarter in reinforcing bars.

Cleveland, April 15.—Several small 25 or 50-ton lots of concrete bars have been let and one 230-ton lot was awarded since the two piers, 269 tons, went to Paterson-Leitch Co. The 13 additional piers for Central-Lorain bridge will take about 100 tons apiece. Fulton road-Brookside park bridge, 1600 tons, comes up for bids tomorrow. Lower than 1.85c, Cleveland or Pittsburgh, has appeared.

Awards Compared

	Tons
Awards this week	9,599
Awards last week	8,640
Awards two weeks ago	5,410
Awards this week in 1929	6,375
Average weekly awards, 1929	5,849
Average weekly awards, 1930	6,730
Average weekly awards, Mar.	10,172
Total awards to date, 1929	103,193
Total awards to date, 1930	107,672

CONTRACTS PLACED

2400 tons, seawall, Port Arthur, Tex., to Laclede Steel Co., through H. Horace Williams, New Orleans, general contractor.

2000 tons, Pilgrim hospital buildings, Brentwood,

N. Y., to Jones & Laughlin Steel Corp. through Turner Construction Co.
1500 tons, ramps and flooring, West Side elevated highway, New York, to unstated mill.
600 tons, grade crossing work, Long Island railroad, Ozone Park, N. Y., to Carroll-McCreary & Co. Inc.
400 tons, branch exchange, New England Telephone & Telegraph Co., Boston, to Barker Steel Co.
350 tons, building, Gottfried Baking Co., West Fifty-first street, New York, to Faitoute Iron & Steel Co.
300 tons, bridge, Croton reservoir, Westchester county, N. Y., to Carroll-McCreary & Co. Inc.
269 tons, two piers, Central-Lorain bridge, Cleveland, to Paterson-Leitch Co., through Walsh Construction Co.
240 tons, school, Caldwell, N. J., to Joseph T. Ryerson & Son Inc.
230 tons, service building, Western Reserve university, Cleveland, to Bourne-Fuller Co.
200 tons, grade crossing, New York Central railroad, 158th street, New York, to Carroll-McCreary & Co. Inc.
150 tons, coal pocket, Jersey City, N. J., to Joseph T. Ryerson & Son Inc.
135 tons, sewage disposal plant building, Galesburg, Ill., to Truscon Steel Co.
125 tons, reptile house, National Zoological park, Washington, to Concrete Steel Co.
100 tons, Y. M. H. A. building, Baltimore, to Kalman Steel Co.
100 tons, synagogue, Hebrew Benevolent congregation, Atlanta, Ga., to Southern General Fireproof Co.
100 tons, officers' quarters, Fort Benning, Ga., to Connors Steel Co. and Concrete Steel Co.
100 tons, theater, Lynchburg Theatre Corp., Lynchburg, Va., to Concrete Steel Co.
100 tons, warehouse, Great Atlantic & Pacific Tea Co., Atlanta, Ga., to Truscon Steel Co.
100 tons, Pennsylvania state highway bridge, Fair Haven, Pa., to Electric Welding Co.
100 tons, film exchange building, Michigan avenue and Thirteenth street, Chicago, to Inland Steel Co.
Unstated tonnage, Waldorf-Astoria hotel, New York, to National Bridge Co.

CONTRACTS PENDING

1600 tons, Fulton road—Brookside park bridge, Cleveland; bids close April 16.
1400 tons, 440 miles Illinois state road work; bids tabulated.
1300 tons, 13 additional piers, Central-Lorain bridge, Cleveland; bids about to be asked.
700 tons, foundations for outer drive bridge, Lincoln Park district, Chicago.
600 tons, apartment, Seventieth street, Chicago.
565 tons addition, Greenbrier hotel, White Sulphur Springs, W. Va.; general contract to John W. Cowper Co., Buffalo.

Refractories Institute Is Adopting New Code

The American Refractories institute, Oliver building, Pittsburgh, has adopted a code of ethics for use of its members, the code being prepared "in an effort to eliminate unfair trade practice, unfair competition, and economic waste which exist in the refractories industry and which have resulted disastrously to manufacturer and customer alike." The code sets forth the practices to be indorsed by the institute and outlines the procedure recommended in all dealings of the members.

Another publication of the institute is "Classification of Modified Rectangular or Difficult Fire Clay, Silica, and High Alumina Shapes." This loose leaf pamphlet contains many sketches of shapes, and definitely defines all such materials so that a standard may be recognized in order to simplify and clarify the work of the refractories industry.

Rails, Cars

Rolling Stock Inquiries, Sales Lighter—5000 Tons Rails Bought —Fastenings Orders Average

SIX lots of cars, aggregating 1029 cars, including 500 tank cars for Louisville & Arkansas, were let. Miscellaneous rail purchases in Chicago and Cleveland total 7500 tons. New York has 1000 tons pending for subways. Track accessory demand is well maintained, Chicago mills reporting about 3000 tons weekly. Rolling stock inquiries generally are slower. Locomotive demand is duller.

RAILROAD TRACK PRICES, PAGE 74

New York, April 15.—Demand for railroad rolling equipment remains light, with little new inquiry of definite character. Approximately 1000 tons of rails is pending for subway work here on which the Ericksen Equipment Co. is general contractor. Pennsylvania placed second quarter contracts for track fastenings for its western division with Carnegie, Illinois and Inland Steel companies.

Only about 1300 freight and 48 passenger cars are actively pending. New York, New Haven & Hartford ordered 15 coke cars from Standard Steel Car Co. Union Pacific will build 300 flats in its own shops and is inquiring for underframes.

Pittsburgh, April 15.—Railroad equipment is quiet with little new business appearing in either track material or cars. Specifications against old orders are in fair seasonal volume but no inquiry is appearing for additional tonnage. Prices remain steady on most products with the exception of light rails. Demand continues quiet.

Cleveland, April 15.—Rail orders received recently by Carnegie Steel Co. include 2000 tons for Wheeling & Lake Erie and 500 tons for Akron, Canton & Youngstown.

Chicago, April 15.—Chicago district rail mills have just booked about 5000 tons of rails in several miscellaneous lots. This tonnage included a number of spot tonnages for several electric lines and smaller steam roads, in addition to tonnage for frog and switch makers. Track accessory sales totaled nearly 3000 tons. Rail mill operations are close to capacity, with primary rail bookings assuring that rate well into July.

CAR ORDERS PLACED

Cities Service Tank Line, 100 tank cars, to General American Tank Car Corp.
Detroit Street railways, 150 street cars, to St. Louis Car Co.
Inland Lime & Stone Co., Chicago, 14 air dump cars, to Koppel Industrial Car & Equipment Co.
Louisville & Arkansas, 500 tank cars, to General American Tank Car Corp.
Michigan Central, repairs for 1000 steel cars, to own shops at Marshall, Mich.
Mobile & Northern, 250 box cars, to American Car & Foundry Co.
New York, New Haven & Hartford, 15 coke cars, to Standard Steel Car Co.
Union Pacific, 300 flats to own shops; now inquiring for underframes.

RAIL ORDERS PLACED

Wheeling & Lake Erie, 2000 tons, to Carnegie Steel Co.
Akron, Canton & Youngstown, 500 tons, to Carnegie Steel Co.

CAR ORDERS PENDING

Amtorg Trading Corp., 50 air dump cars.
Missouri, Kansas, Texas, three diners.
National Tube Co., six ore dump cars.
Tennessee Copper Co., 10 to 30 tank cars.

LOCOMOTIVE ORDERS PENDING

Indianapolis Union, four switch engines.

British Foundry Expert To Speak Here

J. G. Pearce, director, British Cast Iron Research association Birmingham England, and author of the exchange paper of the Institute of British Foundrymen, which will be presented at the coming Cleveland convention of the American Foundrymen's association, will embark on a speaking tour soon after the meeting. Mr. Pearce will land in New York on April 28. Immediately following the convention, he will go to Canada for a week and then start a speaking tour during which he will address the Detroit Foundrymen's association on May 2; Quad-City Foundrymen's association on May 5; Chicago Foundrymen's club on May 6; Wisconsin Gray Iron Foundry group on May 7 and the Philadelphia Foundrymen's association on May 27. He will leave New York on May 30 to return to England.

Book Outlines History of Weighing Devices

Fairbanks, Morse & Co., Chicago, have prepared a 20-page illustrated booklet, entitled "Beginning the second Century," which outlines the history and developments of weighing devices and power equipment during the first hundred years of the company's existence and shows the present position of these fields with regard to future advancement. The booklet has three chapters "100 Years of Accurate Weighing," "The Age of Power" and "A New Era of Speed and Accuracy."

Strip

Some Improvement in Demand Over March Rate—Spot Buying Continues the Rule

USERS of steel strip are ordering at a slightly better rate as demand for their products makes some increase. Orders are for prompt shipment and coverage for future weeks has not been started. Producers are operating at slightly better rate. Bookings are well ahead of the minimum in March, which set a low record. Prices are not strong and tonnages gain concessions.

STRIP PRICES, PAGE 74

Pittsburgh, April 15.—Strip steel demand continues to show moderate improvement. Incoming tonnage is well ahead of March although there remains considerable room for further improvement. Heavier specifications from automotive interests accounts for the better demand although most orders represent early requirements and buyers are not anticipating future needs. Operations are slightly heavier with schedules of cold mills higher at 40 per cent. Hot mill operations are up slightly at 60 to 65 per cent. Prices are steady at 1.70c and 1.80c on most tonnage in hot strip, with small orders bringing 1.80c and 1.90c. Cold strip continues 2.55c to 2.65c.

New York, April 15.—Strip steel reflects continued weakness. Wide hot strip is quoted at 1.70c to 1.80c and narrow at 1.80c to 1.90c, Pittsburgh. Cold strip is 2.55c to 2.65c, Pittsburgh, a revision of five points in the inside figure. Trading is dull.

Cleveland, April 15.—Hot and cold strip sales are a trifle more numerous, although large tonnage orders continue to develop lower prices, such as 1.70c, Pittsburgh, on wide hot strip, 1.80c on narrow, and 2.55c, Cleveland, on cold. Auto parts makers are specifying a little more liberally, although order books still are not as large as it was expected they would be at this time.

Chicago, April 15.—Hot-rolled strip prices are 1.90c to 2.00c for narrow, and 1.80c to 1.90c for wide. Mill operations are about 60 per cent. Cold-rolled strip mills report the operating rate under 45 per cent, with prices unchanged at 2.55c to 2.65c, Pittsburgh-Cleveland.

Philadelphia, April 15.—Hot strip steel continues 1.70c to 1.80c, base, Pittsburgh, for material 6 to 24 inches wide, and 1.80c to 1.90c on widths up to 6-inch. Cold strip generally is 2.55c, base, Pittsburgh. Stripsheet continues usually 1.90c and 2.05c, base, Pittsburgh, on heavy and light gages, respectively, with concessions of $2 a ton or more in some cases on especially desirabe business.

Iron Workers Convene

Youngstown, O., April 15.—Annual convention of the Amalgamated Association of Iron, Steel and Tin Plate workers began today. Recent changes in sheet and tin plate mill practice and the advent of the continuous sheet mill will cause much discussion, it is believed. Reports on wages and working conditions will be considered which will be submitted to employes at the annual conference in June at Atlantic City, N. J.

Metal lath department of the Youngstown Pressed Steel Co., Warren, O., is being operated ten hours daily, since its purchase by United States Gypsum Co., Chicago.

Cold Finished Steel

See Moderate Improvement, Yet Buyers Hold to Early Needs

COLD FINISHED PRICES, PAGE 74

Pittsburgh, April 15.—Specifications for cold-finished steel bars show a moderate improvement since the first of the month, with the bulk of the gain coming from automotive users. Requirements of other buyers hold at about their former rate but still are relatively better than those of the automotive industry. Buyers still are slow to place material beyond their early requirements. The market is steady at 2.10c, Pittsburgh.

Cleveland, April 15.—By a fair margin more tonnage is being shipped by cold finished bar producers this month than last. Automobile and allied-line specifications are increasingly active. Miscellaneous consuming lines are taking small amounts. The 2.10c, Cleveland, price holds.

Western Indiana Gravel Machine Co., Elwood, Ind., has changed its name to Elwood Mfg. Co.

Wire

Nails Reduced 10 Cents Keg—Wire Buying Gains With Prices Steady—Auto Needs Up Slowly

SLIGHT betterment is appearing in the market for wire and its products, though it is not marked. Mills are able to continue production at the prevailing rate. Most improvement is in manufacturers' wire, with fencing also showing gain. Automotive needs are increasing slowly. Nails are slow and quotations have been reduced from $2.30 to $2.20 per keg by makers.

WIRE PRICES, PAGE 74

Chicago, April 15.—Manufacturers' wire, while holding to the recent average, is making no gains, due largely to light automotive buying. Merchant wire products, including nails and fencing, are moving at a good average rate for the season. Operations continue at 50 to 55 per cent for western mills. The market for nails is quoted at $2.35 to jobbers, although forward buying is light. Plain wire is quoted at 2.45c, Chicago or western mills.

Worcester, Mass., April 15.—Conditions in the wire market have changed little and production is at 60 to 65 per cent of capacity. Some automotive specifications have been received. Prices are unchanged.

New York, April 15.—Conditions in the wire nail market are highly unsettled, the going prices being $2.15 to $2.20, Pittsburgh, per 100-pound keg. Bright plain wire is steady at 2.40c, Pittsburgh-Cleveland, with demand moderate.

Pittsburgh, April 15.—Wire nails have been reduced 10 cents per keg, the new level being $2.20, Pittsburgh-Cleveland, to jobbers and $2.30 to the trade. Demand is only moderate, due in part to the unsettled price condition. Manufacturers' wire, quoted at 2.40c, Pittsburgh-Cleveland, is showing some improvement. Wire rods are steady at $38.

Cleveland, April 15.—Formal recognition is being given to concessions in wire nails by a reduction of 10c per 100-pound keg to $2.20, Cleveland, to jobbers, and a similar reduction to $2.30 to the retail trade. Wire is unchanged at 2.40c, Cleveland. Jobbers and retailers are buying more actively in mixed carloads as well as straight carloads. Manufacturers' wire orders are fairly heavy from nut, bolt, rivet and screw producers. Fencing is quiet.

May Raise Wire Screen

New York, April 15.—Manufacturers of wire screen cloth are reported considering an advance in price.

Nonferrous Metals

Consumption Appears Largest Since Last Autumn Despite Light New Demand—Copper Price Cut 4 Cents—Tin and Zinc Easy

Prices of the Week, Cents a Pound

	Copper			Straits Tin		Lead	Lead East	Zinc	98-99%	Spot	Ingot
	Electro delivered	Lake delivered	Casting refinery	New York Spot	York Futures	New York	St. Louis	St. Louis	Aluminum	Antimony	Nickel
April 9	18.00	18.10	17.30	36.90	37.30	5.50	5.40	4.95	23.90	7.90	35.00
April 10	18.00	18.10	17.30	37.00	37.35	5.50	5.40	4.92½	23.90	7.80	35.00
April 11	18.00	18.10	17.30	37.20	37.60	5.50	5.40	4.92½	23.90	7.80	35.00
April 14	18.00	18.10	17.30	36.37½	36.75	5.50	5.40	4.90	23.90	7.75	35.00
April 15	14.00	14.10	13.75	36.45	36.80	5.50	5.40	4.90	23.90	7.75	35.00

NEW YORK, April 15.—New business in nonferrous metals has been light in the past week, though consumption now appears to be larger than at any other time since last autumn. Most prices have tended downward, while copper broke sharply to 14.00c, Connecticut, on Tuesday.

Brass mills are doing a little better business now than at any time since the slump of last autumn. New buying is not increasing rapidly, however. The copper wire market, which developed favorably early in the year has shown little change since then. It is hoped in the trade that these and other metal products will pick up through a likely increase in building this spring. The automobile industry has aided business already.

Copper—Producers lowered prices sensationally on Tuesday following almost a year of unchanged quotations at the 18-cent level. The 4-cent cut brought out some demand and actual business was done at the new prices. General uncertainty as to buying policies resulted immediately from the reduction and this condition extended into such related markets as scrap metals, brass ingots, and copper and brass products. Corresponding price cuts in these materials was expected momentarily after the virgin metal drop. Refined copper stocks at the end of March were the largest since January, 1922, amounting to 256,020 tons, or over four and one-half times the size of stocks when prices settled to the 18-cent level in April a year ago. Copper orders were extremely light prior to the Tuesday cut.

Zinc—Recent buying movement, which brought about a recovery of 10 to 15 points in prices, has not relieved producers from pressure of excess stocks. The result is that the market has slipped back from a spread of 4.95c to 5.00c, East St. Louis, to 4.90c. Shipments are moving at a fair rate.

Tin—Users have done very little buying in the market for two weeks. The result is that nearly all of the recent recovery in price has been lost. The rise was due to the technical situation in London and professional support, while there was very little activity of any kind in the market here. The statistical situation continues decidedly adverse and though there is continued talk of curtailment, there is very little evidence of it.

Lead—Buying has picked up again with the market remaining unchanged for several days. Consumption of lead is much nearer to normal than that of any other metal, and as users are not covered far ahead they have to return constantly to the market irrespective of the price situation. At the lower level the market again appears firmer with London well above New York parity.

Aluminum—Business still is lagging, but is a little larger than in the winter. Prices are unchanged but there is some talk that the prospective cut of 1½ cent in the tariff may cause a cut in prices.—*Daily Metal Trade.*

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified

SHEETS	
Yellow brass (high)	23.25
Copper, hot rolled	27.75
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-pound base)	10.00
Zinc strip (100-pound base)	9.50
Aluminum, flat sheets, up to 10 gage, 3 to 72 inches wide	31.30
SEAMLESS TUBE	
Yellow brass (high)	28.25
Copper	29.25
RODS	
Yellow brass (high, full turnings)	21.25
Naval brass	24.00
WIRE	
Copper	19.87½
Yellow brass (high)	23.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	11.25 to 11.75
Chicago	10.50 to 10.75
Cleveland	11.00 to 11.50
St. Louis	10.00 to 10.50
HEAVY YELLOW BRASS	
Cleveland	7.00 to 7.50
HEAVY COPPER AND WIRE	
New York	14.50 to 14.75
Boston	14.00 to 14.50
Chicago	14.00 to 14.25
Cleveland	13.00 to 14.00
St. Louis	10.50 to 11.00
RED BRASS BORINGS	
New York	10.25 to 10.75
YELLOW BRASS TUBING	
Cleveland	7.00 to 7.50
LIGHT COPPER	
New York	12.50 to 13.00
Chicago	12.25 to 12.50
Cleveland	11.50 to 12.50
St. Louis	10.50 to 11.00
LIGHT BRASS	
Boston	6.50 to 7.00
Chicago	6.50 to 6.75
Cleveland	5.50 to 6.00
St. Louis	5.75 to 6.25
ZINC	
New York	2.50 to 2.75
Cleveland	2.00 to 2.50
St. Louis	2.50
ALUMINUM	
Clippings, soft, Cleveland	13.00 to 14.00
Clippings, hard, Cleveland	10.00 to 11.00
Borings, Cleveland	7.00 to 7.50
Cast, Cleveland	9.00 to 9.50
Cast, Boston	9.00 to 9.50
Cast, St. Louis	9.00 to 9.50

Secondary Metals

Remelt aluminum No. 12	16.00 to 16.50
Brass ingot, 85-5-5-5	15.50 to 15.75

Coke By-Products

Shipments Improve Slowly—Sulphate of Ammonia Easy—Toluol Active

New York, April 15.—While volume is somewhat below last year's level at this time, shipments of light oil distillates are gradually improving. There has been some curtailment in output, although not greatly reduced.

Coke By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.35
Solvent naphtha	0.28
Commercial xylol	0.28
Per Pound at Producers' Plants	
250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.00 to $2.10

Rumors of a possible import duty on benzol for motor fuel by Germany holds the attention of the export trade. Toluol is slightly more active. Solvent naphtha and commercial xylol follow closely the consumption of benzol. Prices are firm and unchanged. Buying of phenol is fair, with the lacquer trade taking a good share of the output. The market lacks snap, however, and supplies are ample.

Quicksilver Is Dull

New York, April 15.—Quicksilver is in a dull market, with some metal available at $115 a flask, though some sellers ask more.

Warehouse

Turn to Building For Hope of Increased Volume—Slight Gain in Demand Recently —Price Situation Quiet

OPTIMISM is expressed from all districts, due in part to a generally reported moderate gain since the first of the month and to expectations of better weather and hope for second quarter improvement. Demand can hardly be said to be coming from any particular source and present appearances suggest that outdoor building may be the first to lend support. Prices are steady with hot-rolled quantity extras in some quarters reported increasing the size of sales.

New York—Jobbing demand is showing a further slight gain but improvement is not up to expectations of a month ago. Business is spotty with prices easy and unchanged.

Buffalo—Substantial second-quarter improvement is looked for over the first three months of the year since greatly improved weather conditions have stimulated sales, particularly building materials during the last week.

Pittsburgh—Sales are improved but the gain over last month is slight. Sheets are moving more freely. New differentials are being instituted on 1¼-inch galvanized corrugated roofing.

Detroit—General business is somewhat improved, but no demand comes from any particular industry. Prices are the same and the quantity reduction extras are being favorably accepted.

Cincinnati—Structural shapes took the lead in a moderate improvement in warehouse demand, although the tonnage remains considerably below the rate last year. Prices are unchanged.

Chicago—Lengthening mill deliveries lend some improvement to the second quarter. New hot-rolled quantity extras have resulted in larger individual sales, the differential of 50c extra for lots under 399 pounds, being specially avoided.

St. Louis—Demand still is slow. Materials for highway construction, river, power and bridge work are relatively active. Country machine shops and distributors are taking less than their usual quotas and nails, bolts and screws are dull. The price situation is quiet.

Philadelphia—Jobbers report the business lag continuing with prices firm and unchanged.

Cleveland—A decided lack of orders involving anything like sizable tonnages characterizes the local warehouse market. Mills are now taking orders for eight and ten tons, delivering the material within the week.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

Hot Mill Products Subject to New Quantity Differentials Adopted March 3, 400 to 3999 Pounds Being Base

STEEL BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Houston	3.00c
Los Angeles	3.30c
New York††	3.25c
Philadelphia	2.80c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
New York††	3.25c
Philadelphia	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	2.665c
Buffalo	2.95c
Chattanooga	3.25c
Cincinnati	3.30c
Cleveland	2.25c to 2.44c
Detroit	2.30c to 3.00c
Houston	3.00c
Los Angeles cl.	2.40c
Los Angeles lcl.	2.70c
New York	2.65c to 3.10c
Philadelphia	2.65c to 3.00c
Pittsburgh	2.75c
San Francisco cl.	2.30c
San Francisco lcl.	2.60c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Houston	3.25c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland ¼ in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	2.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.60c
Boston 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Houston	3.90c
Los Angeles	3.85c
New York	3.50c to 3.60c
Portland	3.75c
Philadelphia*†	3.25c
Pittsburgh**	3.25c to 3.35c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.54½c
Tulsa	4.20c to 4.34c

NO. 24 BLACK SHEETS

Baltimore*†	3.75c
Boston	4.85c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Cleveland***	3.75c
Detroit	3.95c
Los Angeles	4.75c
New York	3.65c to 3.90c
Philadelphia*†	3.80c
Pittsburgh**	3.65c to 3.75c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.84c

NO. 24 GALVANIZED SHEETS

Baltimore*†	4.50c
Boston	5.60c
Buffalo	4.40c to 4.60c
Chicago (local delivery)	4.60c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.50c
Detroit	4.60c
Houston	5.40c
Los Angeles	5.20c
Pittsburgh**	4.30c
Philadelphia*†	4.45c
Pittsburgh**	4.40c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.10c to 5.35c

BANDS

Baltimore	4.00c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chattanooga	3.45c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c to 3.65c
Detroit 3/16-in. and lighter	3.30c
Houston	3.65c
Los Angeles	4.30c
New York	3.75c
Philadelphia	3.30c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	4.50c to 4.69c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York	4.25c
Philadelphia	3.55c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, hexagons	Flats squares
Baltimore (c)	3.50c	(a) 4.00c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chattanooga*	3.85c	4.35c(d)
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.40c	3.90c
Pittsburgh	3.60c	4.10c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	4.75c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.64c	5.14c

(a) Rounds only; (d) Squares only. *Plus quantity differentials.

COLD ROLLED STRIP

Boston, 0.100-inch 500 pounds lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.05c
Philadelphia (c)	5.05c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	12.50c
Iron bars, round	6.25c
Iron bars, flats and squares	6.50c

††Domestic bars. **Less than 25 sheets. *†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Pacific Coast

Northwest Market Feels Increase in Demand—New Differentials in Force

ACTIVITY in Washington has opened up as the season advances and a decidedly better demand exists in most lines. French cast pipe makers have taken a tonnage for a Seattle water main. California conditions are little improved. A contract has been let for battledeck flooring for a shiploading platform at San Francisco, the first of this type floor on the coast.

Seattle, April 9.—Demand for iron and steel products in the Pacific Northwest is increasing. While awards this week were below normal, considerable new business has developed and heavy tonnages are pending.

Pig Iron and Coke

Foundry activity has increased during the last fortnight and much new business has been booked. The trade is buying Tyneside coke at $14 and getting quick deliveries with frequent steamship service from England. Some Burn iron has been purchased at $25, analyzing 2.75 to 3.25, while Columbia is quoted at $26 in less than 100 ton lots or $25.50 in larger tonnages.

Bars, Plates and Shapes

The market is holding steady, mill prices of merchant bars and shapes being unchanged at 2.35c, reinforcing at 2.30c and plates at 2.25c, with concessions for desirable tonnages.

Local steel plants have fair tonnage on books, much in car lots. Contract for the Youngstown place viaduct, 225 tons, and several building projects, are pending but will be awarded soon. No contracts of more than 100 tons were reported this week.

Commercial Boiler Works is now ready to place 1000 tons of plates for Seattle's Diablo dam penstock. The general contract was awarded several months ago and was then announced as 500 tons. Several important plate projects are immediately pending including two large boilers for Tacoma, bids in, about 400 tons for a Tacoma pipe line job, bids in, 300 tons for a project at Everett, bids April 14, a penstock at Centralia, Wash., and 14,800 feet of 20-inch steel or wood pipe for Renton, Wash., bids April 15. Everett, Wash., also will open bids this week for two standpipes, total capacity 750,000 gallons.

Awards of structurals this week were confined to jobs of less than 100 tons each. Local fabricating plants are in active operation.

Finished Materials

Jobbers report an increased volume of business, spring buying having developed rapidly during the last two weeks. Everything out of stock is in improved demand. Wholesale prices are unchanged.

Seattle has awarded for $129,964 the general contract for an underground duct system for the city lighting system. A foreign motorship is due at Everett late this month with 168 tons of machinery from Sweden for the new plant of the Puget Sound Pulp & Timber Co. Hofius Steel & Equipment Co. has the contract to furnish track spikes for the Seattle street railway.

Pipe to French Makers

The general contractors for the Twenty-ninth avenue N. W., Seattle, water extension have awarded to French manufacturers the subcontract for furnishing about 325 tons of cast iron pipe. Several important pipe jobs are pending in this district.

Old Materials

Steel scrap is unchanged, the local mill price being $10 and $11, gross, with buyers quite discriminating as to quality. Receipts are somewhat in excess of consumption. A local firm is breaking up two naval vessels but the steel has not yet been sold. Cast iron scrap is more than ample for present needs. Foundries are buying in small lots at $11 to $13.50, with $13, net ton, a fair average.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Build Battledeck Floor

San Francisco, April 12.—(*By Air Mail*)—Movement of steel products on the Pacific Coast continues slow and tonnages are considerably below the totals for the corresponding period last year. The largest award of the week involved 300 tons of plates and shapes for a ship-loading platform in San Francisco, booked by Herrick Iron Works. This project calls for 2000 square feet of 5/16-inch battleship deck flooring, the first installation of this type of construction in the West.

Bars, Plates and Shapes

Demand for reinforcing steel bars is especially quiet and awards this week were in lots of less than 100 tons. The only new inquiry of importance involves 130 tons for a drainage project in Los Angeles county, bids on which will be opened May 5. Prices in the San Francisco district continue firm at 2.30c, base, on carload lots. Los Angeles prices are firm at 2.40c, base.

Pacific Fruit Express Co., San Francisco, has an inquiry for 2750 tons of plates and shapes for underframes for cars to be built in its own shops. The only important award went to the Chicago Bridge & Iron Works, 100 tons for a steel tank and tower for Southgate, Calif. Prices continue 2.20c, c.i.f.

Shape awards aggregated 1160 tons and included 150 tons for a viaduct over Steiner creek for the Southern Pacific Co. and 250 tons for three hammerhead cranes at Mare Island, both placed with Dyer Bros. The Consolidated Steel Corp. secured 150 tons for a grade separation at Muscat. New inquiries include 1000 tons for a building for the Shell Oil Co. and 450 tons for a store in Oakland. Plain material is firm at 2.35c, c.i.f.

Other Finished Material

Demand for cast iron pipe has fallen off during the past ten days. Awards this week totaled 678 tons. The American Cast Iron Pipe Co. [illegible] tons for the Bear Gulch Water Co., Menlo Park, Calif. Santa Ana, Calif., has opened bids on 617 tons.

Distributors in the San Francisco district have adopted a new differential price schedule and quotations now appear to be on a firm basis for the first time in months. This schedule involves carload lots, mixed carload lots, lots of over 1000 pounds, lots of from 500 to 999 pounds and lots of less than 500 tons.

	Carload lots	Mixed Carload	1000 lbs. & over	500 to 999	Under 500 lbs.
Plates	2.45c	2.55c	2.75c	2.85c	2.95c
Shapes and mild steel bars	2.40	2.70	2.75	2.85	2.95
Shapes 6-in. and over	2.65	2.75	2.85	2.95	3.05
Galvanized sheets (No. 24)	4.30	4.40	4.60	4.70	4.80
Blue annealed sheets (No. 10)	3.05	3.15	3.35	3.45	3.55
Black sheets (No. 24)	3.65	3.75	4.00	4.10	4.20

Ships Plates By Water

Arrival of the steamer BURLINGTON, especially equipped to transport steel, in Milwaukee April 7, with a cargo of plates for the A. O. Smith Corp. marked the beginning of a new transportation policy by the company, probably the largest consumer of steel in the West. According to George B. Hetherington, traffic manager, it has been decided to bring a larger share of its steel purchases to Milwaukee by boat from the Chicago producing area. Practically the entire supply of plates needed for the automobile frame department will be shipped from Gary by boat, although for the present most of the material for electrically welded pipe will come by rail. The BURLINGTON brought 2500 tons on its first trip and can easily make two trips between Gary and Milwaukee each week.

Will Use Strip in Sheet Mill at Fairfield

Birmingham, Ala., April 15.—Included in improvements planned for the Fairfield works of the Tennessee Coal, Iron & Railroad Co., subsidiary of the United States Steel Corp., is a continuous strip mill, of the American Rolling Mill Co. type, which will roll strip to be used in the sheet mill.

The Tennessee company has been authorized by the Corporation's finance committee to add a 150-ton open-hearth steel furnace, alter the blooming mill, install an additional soaking pit, and increase the capacity of the sheet mill. Altogether, about $8,000,000 will be spent.

Machine Tool Orders Up

Cincinnati, April 15.—March shows the three months' trend of orders moving up slightly, according to the National Machine Tool Builders' association. Shipments for March were only slightly better than February, and unfilled orders were down to the lowest since the summer of 1928. Following are monthly averages:

1929	*Index A	*Index B	*Index C	*Total
January	286.6	278.3	294.2	285.6
February	303.2	285.7	330.6	300.8
March	321.4	319.6	330.8	320.8
April	330.1	328.5	349.3	330.0
May	328.2	330.7	354.9	329.5
June	315.6	308.4	346.4	315.2
July	296.2	284.6	324.6	294.8
August	284.2	279.7	272.6	286.1
September	268.5	258.6	252.3	265.8
October	295.4	263.0	269.0	287.0
November	250.8	235.7	261.2	247.2
December	224.0	212.7	258.3	222.1
1930				
January	173.8	171.9	226.8	175.4
February	170.3	169.1	213.6	172.6
March	172.8	184.0	219.7	177.8

*Note—Index A, base more than $50,000; Index B, base $10,000 to $50,000; Index C, base less than $10,000. Base: average shipments for years 1922-23-24. Totals: The total of all reports is not an average of A, B and C, but represents the total sum of each item in percentage of the total base.

Crane Shipments Are Up

New York, April 15.—March shipments of overhead electric cranes totaled 105, compared with 95 in February, tonnage rising correspondingly from 1264¾ to 1969½ tons. Value rose from $773,068.05 to $1,058,761.76, a substantial increase.

New orders for March were 108 with a tonnage capacity of 1412 and a value of $850,658.50. This also represented an increase from February figures which were 91 units with a tonnage capacity of 1194¼ and a valuation of $832,357.45.

Unfilled orders on April 1 were fractionally lower, embracing 301 units, 5397 tons capacity and $3,524,732.68 value. Similar bookings on March 1 were 302 cranes with a tonnage of 6134½ and a value of $3,835,790.94.

Pig Iron

(*Concluded from Page* 75)

though below that for the comparable period last year. Sales in this district in the past week totaled 10,000 tons, including 5000 tons placed by a steelmaker with the St. Louis Gas & Coke Corp. Prices are steady.

Philadelphia, April 15.—Several tonnages of southern pig iron were sold here in the past week, the principal sale being 1500 tons to the Baltimore plant of a sanitary manufacturing company. Demand for small lots of foundry iron is fairly good and the melt appears sustained at the level of the first quarter. Eastern Pennsylvania foundry iron continues $19.50, base, furnace, for this district. The Delaware River Steel Co. banked its furnace at Chester, Pa., April 10, making the second furnace in this district to be retired from production recently. Some tonnages of steelmaking iron are pending.

Youngstown, O., April 15.—Further reduction in the number of merchant blast furnaces producing basic iron took place today when the Struthers, O., furnace of the Struthers Iron & Steel Co., started to make standard low phosphorus pig iron. Official announcement came from W. C. Holzworth, president of the Struthers company. For more than 30 years the Struthers stack has been producing basic and foundry grades of pig iron. It has obtained Port Henry and foreign iron ores. Up to this time the only stack in the valley producing standard low phosphorus iron has been that of the Stewart Furnace Co., which has been idle for some months but which still has some iron to sell.

New sales of pig iron in the valleys appear confined to small lots of foundry grades and malleable. Prices are steady.

Birmingham, Ala., April 15.—Sales of pig iron have tapered off, but deliveries are active and production is being maintained at a high rate. The record movement of 107,800 tons of pig iron to the East in the eight months prior to April 1 is likely to be duplicated in the next six months for which period the low rail and water freight rates have been extended. Foundry iron continues $14, base, Birmingham, for local delivery, while prices lower than this apply for distant shipment.

Toronto, Ont., April 15.—As the majority of melters have covered pig iron requirements for second quarter current business is limited to small pompt requirements. Such orders are fairly numerous. Prices are firm.

Stockholders of General Refractories Co. will meet June 28, to vote on increasing capital stock from 300,000 to 600,000 shares.

Steel & Wire To Boost Cold Strip Output by Cuyahoga Works Addition

CLEVELAND, April 15.—American Steel & Wire Co., subsidiary of the United States Steel Corp., recently announced an expansion program for its Cuyahoga works here at Harvard avenue and East Forty-second street. Plans, which are yet indefinite in many details, are centered about an extension to the existing cold-finishing strip mill and equipment.

Not long ago the American Steel & Wire Co. formulated plans for increased output of open-hearth steel at its Newburgh works here. Steelworks there, consisting of seven open-hearth furnaces of nominally 50-ton capacity, are understood to be increased soon in capacity to 100-tons. By an authoritative source it is said that gradually most steel will be produced by the open-hearth process instead of the bessemer method. A blooming mill and two bar mills will complete the Newburgh expansion. This construction which has been known for some time, is expected to care more ably for American Steel & Wire's finishing mills' demand, for in the past there has existed a condition whereby unfinished steel demand at this point has more than exceeded producing capacities and ingots have been brought in here from the Pittsburgh district.

It is partly to avoid freight rates that would necessarily result, partly to round out the producing units here and partly to care for increased demands that the new cold-drawing strip facilities are to be constructed. Building will begin at once and upon expected completion within six to eight months, actual production largely of cold-drawn strip will begin. To augment the annual output of approximately 100,000 tons of strip from this district plant, facilities for 40,000 tons additional will thus be afforded.

According to L. J. Gray, assistant to the president, no new sizes of strip will be added, but present lines which now are in output up to 20-inch will be simply added to in increased volume to care for trade requirements. It was also stated today by Mr. Gray that extension will cost probably $2,000,000 and as yet some details of the construction are being withheld while several features involved are in process of being worked out.

Sale of Sheet & Tube Is Ratified

Two-thirds of Stock Favors Union with Bethlehem, but Consummation Is Faced with Delays as Eaton Opposition Promises Court Action

YOUNGSTOWN, O., April 15.—Approval of the sale of the Youngstown Sheet & Tube Co. to the Bethlehem Steel Co. has been voted by the necessary two-thirds of the total shares of common stock outstanding. Final consummation of the merger seems likely to await decisions of courts in the remnants of several injunction suits still pending in common pleas court here, while appeals of similar actions and also of federal court holdings at Cleveland are threatened. For the present, Sheet & Tube will continue to be operated as a separate unit.

The federal department of justice has announced from Washington, probably under the spur of certain congressional declamations, that it will take a look into the merger as a matter of formality. The statement from the office of the attorney general further said that if the "trust" laws have been violated then some action may be taken. However, at this distance such action by the federal government appears remote.

The vote of the stockholders was taken last Tuesday, April 8, but due to seven court actions inaugurated by the Otis & Co.-Eaton group opposed to the merger, formal announcement of the ballot was not permitted by court injunctions until late on April 11.

The total number of shares entitled to vote was certified by Walter E. Meub, treasurer of the Sheet & Tube company, as 1,199,612 shares of common stock of record on March 22,1930. The vote favoring the merger, as announced finally last Friday afternoon, was 857,851. The vote opposed to the merger was 341,891. Since the vote of 799,871 shares was necessary to carry the merger, therefore the proponents of the merger won by a margin of 58,079 votes.

Seven lawsuits have been aimed at the merger by the Otis-Eaton group of opponents. On April 2 was started legal action by Arthur B. Taylor, banker of Elyria, O., in common pleas court here to force the Sheet & Tube company to produce records of Bethlehem Steel showing figures on which merger terms were based. No decision was reached.

On April 5 suit was filed in federal district court at Cleveland by B. R. Shover, now of Pittsburgh but formerly general superintendent in charge of construction of the former Brier Hill Steel Co. Mr. Shover asked for an injunction against the merger and against the stockholders holding the meeting set for April 8. This was dismissed by Judge Tuttle of Detroit. So also was the similar suit filed April 7 in federal court at Cleveland on behalf of the Eaton-owned International Shares Inc. Also on April 7 were filed two suits in common pleas court here by Mr. Taylor for himself and in behalf of other stockholders to enjoin the merger and the stockholders' meeting, but no decision has been announced. The sixth suit was started April 7 in common pleas court here by Otis & Co., Cleveland brokers and representatives of Cyrus S. Eaton, opposing the merger. This suit asked an injunction against the voting of something over 51,000 shares owned by Otis & Co. but on which proxies were held by the merger proxy committee. This suit was dismissed Wednesday morning by Judge Turnbaugh, after his holding the other way following a midnight session of court Tuesday night in his bedroom in a local hotel.

The seventh suit was begun by Myron C. Wick in which he contested the voting of 88,792 proxies including those of the Otis & Co. stock transferred since the date of record, March 22. At the moment a temporary restraining order was issued by Judge Turnbaugh, but just before the Friday afternoon meeting scheduled for final announcement of the result of the vote, which still was in process of counting, verifying, etc., by the inspectors of election ever since last Tuesday, the injunction order in the Wick case was partially lifted by Judge Turnbaugh. A total of 22 lawyers participated in this hearing. Thus the inspectors were permitted to announce the vote as completed and to record the result. However, the judge reserved the right to review the matter later, and it is this remnant of a suit and the reserved decisions of similar cases filed by Mr. Taylor which still remain to be tried out in court.

After the result of the proxy vote had been announced last Friday, formal statements were issued by Chairman Campbell and President Purnell in which they expressed their complete satisfaction over the result of the vote. They reiterated their firm belief in the move being for the best interest of the Sheet & Tube stockholders, for the Bethlehem company and for Youngstown. President E. G. Grace also has made a public statement in which he expressed the satisfaction of the Bethlehem company over the decision of the stockholders of the Youngstown concern to cast in their lot with Bethlehem. Mr. Purnell's statement was:

"While, of course, I cannot speak authoritatively, I believe that the Sheet & Tube company will continue to go ahead just about as it has in the past, except that now it will be a subsidiary of Bethlehem. I can't say that all of the present officers

(*Concluded on Page* 93)

First 10 Make 90 Per Cent of Steel

BETHLEHEM STEEL CO. by acquiring the Youngstown Sheet & Tube Co. increases its pig iron producing capacity to 10,440,000 *gross tons and its steel ingot capacity to* 13,000,000 *tons.*

To this union Bethlehem brings 6,960,000 *tons of pig iron and* 10,000,000 *tons of ingot capacity; Sheet & Tube* 3,480,000 *tons of pig iron and* 3,000,000 *tons of ingots.*

When current enlargements are completed, the United States Steel Corp. will have a capacity of 26,000,000 *tons of ingots. The Steel corporation and Bethlehem combined will account for* 63 *per cent of the country's entire ingot capacity.*

A comparison of the first ten producers, including Sheet & Tube with Bethlehem, follows:

	Steel ingots gross tons	Pig iron gross tons
United States Steel Corp.	26,000,000	21,000,000
Bethlehem Steel Co.	13,000,000	10,440,000
Republic Steel Corp.	4,900,000	2,900,000
Jones & Laughlin Steel Corp.	3,270,000	2,800,000
National Steel Corp.	2,000,000	1,760,000
Inland Steel Co.	1,800,000	950,000
American Rolling Mill Co.	1,557,500	821,400
Wheeling Steel Corp.	1,500,000	1,101,000
Colorado Fuel & Iron Co.	1,200,000	585,000
Corrigan, McKinney Steel Co.	1,000,000	840,000

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

READING IRON CO., Reading, Pa., has elected officers, as follows: Leon E. Thomas, president; John M. Callen, vice president; P. N. Guthrie Jr., vice president; Raymond J. Wenger, vice president, comptroller and assistant treasurer; Henry N. Yost, treasurer; and George W. Delany, secretary. Directors are Andrew J. Maloney, Leon E. Thomas, Randolph Stauffer, John M. Callen, P. N. Guthrie Jr., Raymond J. Wenger. Thomas Iron Co., a subsidiary, elected Mr. Thomas president, Mr. Callen vice president, Mr. Delany secretary, Mr. Yost treasurer and Mr. Wenger assistant treasurer.

* * *

MILTON PRAY CO., San Francisco, has been appointed Pacific coast representative for the Apollo Steel Co., Apollo, Pa.

* * *

CLIMAX MOLYBDENUM CO. will remove its offices May 1 from 61 Broadway to 295 Madison avenue, New York.

* * *

SHANAFELT MFG. CO., Canton, O., manufacturer of foundry flasks, has appointed G. E. Madden, Allegheny and Center streets, Pittsburgh, its representative in that area.

* * *

THEODORE L. DODD & CO., 80 East Jackson boulevard, Chicago, has been appointed western sales representative for the Indiana Pressed Steel Co., Muncie, Ind., manufacturer of steel stampings.

* * *

O D. TUCKER IV & CO., Little Rock, Ark., which has branches in nine southwestern states, have been appointed sales representatives for the Union Chain & Mfg. Co., Sandusky, O., for its silent timing chain.

* * *

FOOTE-BURT CO., Cleveland, has reduced its directorate from six to five and has re-elected the following: G. E. Randles, president; S. E. Gross, treasurer; T. H. Doan Jr., C. H. Burke and Paul J. Bickel,

* * *

R W. CORNWALL MFG. CO. has merged with the Steel Blanking Co., Sandusky, O., under the name of the latter. The company produces stampings of steel, copper, brass and aluminum.

* * *

REYNOLDS METALS CO., Louisville, Ky., has bought the assets of the Midland Metals Co., Chicago. The name will be changed to Midland Foil Co. and the plant will be operated as a division of Reynolds Metals Co.

* * *

CONNERSVILLE BLOWER CO. INC., Connersville, Ind., has moved its Chicago sales office to 20 North Wacker drive, room 1428. After May 1 the company's New York sales office will occupy room 533 in the Graybar building, 520 Lexington avenue.

* * *

ALDA RESEARCH LABORATORIES INC., 660 South Eighteenth street, St. Louis, has been organized to carry on research in metallurgy, ceramic, electrical and industrial chemical engineering, machine design, physical testing, and micrographic, x-ray and radiographic work.

* * *

UNION METAL MFG. CO., Canton, O., has elected directors, as follows: Harry Ross Jones, C. A. Orr, W. A. Porterfield, Homer E. Black, C. W. Wild, R. V. Mitchell, V. D. Steiner. First quarter business is in excess of that of first quarter 1929. Net earnings for 1929 were $4.64 on common stock, compared with $4.32 in 1928.

* * *

INGERSOLL STEEL & DISC CO., New Castle, Ind., division of Borg-Warner Corp. is successor to Galesburg Coulter-Disc Co., Galesburg, Ill., Indiana Rolling Mill Co., New Castle, Ind., and Chicago Rolling Mills Inc., Chicago. The Indiana Rolling Mill Co. will be known as the New Castle division of the Ingersoll Steel & Disc Co.

* * *

A P. GRIMM FOUNDRY CO., Somerville, N. J., has taken over the South Plainfield, N. J., plant of the Spicer Mfg. Co., which recently moved to Toledo, O. The buildings have been leased and the equipment purchased. This addition to its facilities will double the capacity of the Grimm company. The plant will be used for production of bronze, aluminum, and heat-treated aluminum castings, pressure dies and permanent molds.

* * *

HOLLAND FURNACE CO., manufacturer of furnaces at Holland, Mich., has moved its Indianapolis branch offices and warehouse to a new location on East North street in a three-story building remodeled especially for the company. It will contain state offices for Indiana and the division offices for several southern states including Tennessee, Georgia, Alabama, North Carolina and South Carolina.

* * *

GROUP PARTS INC., 222 Harrison street, Syracuse, N. Y., has been made distributor of products of the Fafnir Bearing Co., New Britain, Conn. Replacement parts for automotive products will be carried in stock. Southern Bearings & Parts Co., Birmingham, Ala., distributor of bearings for the Fafnir company for several years, has taken over distribution of Fafnir transmission equipment, succeeding the Moore-Handley Hardware Co.

* * *

AMES SHOVEL & TOOL CO., Anderson, Ind., has started operations in a temporary assembly room. Edwin T. Nipher is superintendent of the plant, which recently suffered a disastrous fire. About 60 employes thrown out of work in February by the fire were given work when the plant reopened. This firm will be augmented until about 50 per cent of the 200 employes are at work. The temporary assembly plant was set up in what formerly was the stock room to the rear of the office building.

* * *

TROTTNER STEEL CO., Cleveland, has been reorganized under the name of Lake Erie Steel Corp., Harry Trottner, founder and former president, selling his holdings and retiring. Morris M. Weiner, formerly vice president and treasurer, has been elected president. H. S. Gottfried, formerly secretary, has been made vice president and secretary and Irving Roth, treasurer, has succeeded Mr. Trottner as director. No other changes will

be made in personnel, and policies will remain the same.

* * *

SISTERVILLE BOILER WORKS, Sisterville, W. Va., will open a branch office at 631 Grant building, Pittsburgh, May 1. R. W. Johns will be district manager.

* * *

MACHINE TOOL & SUPPLY CO., Tulsa, Okla., has been appointed eastern Oklahoma distributor for Norton Co., Worcester, Mass., manufacturer of grinding and abrasive machinery.

* * *

MATHEY GRINDING & MACHINE WORKS, Tulsa, Okla., has moved to new location at 305 East Third street. Company specializes in general industrial and oil field machine work and manufacturing.

* * *

SENECA IRON & STEEL CO., Buffalo, manufacturer of steel sheets, will move its New York branch office to room 3314, Chrysler building, April 18. F. B. Keith is district sales manager.

* * *

STEWART MACHINERY CO., Buder building, St. Louis, has been appointed Mid-Continent distributor for Tube-Turns Inc., Louisville, Ky., manufacturer of fittings for pipe welding.

* * *

PAUL ARBON CO., Tulsa, Okla., has been appointed Mid-Continent distributor for the Atlas Imperial Diesel Engine Co., Oakland, Calif., and is displaying various models for oil field service.

* * *

KAWNEER CO., Niles, Mich., and Zouri Drawn Metals Co., Chicago, have been merged, by exchange of stock. The Zouri company will retain its identity and continue to operate its plant at Chicago, in charge of Lowell Chapin, its president.

* * *

A O. SMITH CORP., Milwaukee, has booked a large order for pressure tanks from the Atmospheric Nitrogen Co. for its plant at Hopewell, Va. The order calls for two units, 85 feet long, 100 inches in diameter and weighing 270,000 pounds each.

* * *

INGALLS IRON WORKS CO. INC., Birmingham, Ala., has bought the plants of the Bollinger-Andrews Construction Co. and the Pennsylvania Fabricating Co., Verona, Pa. The new owner is adding to the plants and improving them, additional equipment being installed. The Ingalls Iron Works Co. Inc. has several plants and does a widespread domestic business in addition to exporting steel products. Ingalls Steel Products Co., manufacturer of steel joists, and Steel Construction Co., erector of steel, are subsidiaries. Products include structural steel and gasoline, septic and general storage tanks.

* * *

CHAIN BELT CO., Milwaukee, has appointed R. B. Everett Co., Houston, Tex., distributor of its complete line of construction equipment, and J. D. Adams Mfg. Co., Indianapolis, exclusive distributor in that territory for its new paver and road pump.

* * *

BUCK STOVE & RANGE CO., St. Louis, founded in 1846, is to be liquidated, stockholders having voted that action. It is capitalized at $1,500,000 and its business has been between $1,000,000 and $1,500,000 annually. Pressure of competition and high taxes are given as reasons for this action.

* * *

DONOVAN BOILER WORKS INC., Parkersburg, W. Va., is at work on what is claimed to be the largest boilers ever built for use in the oil field. They will be each 150 horsepower with 350 pounds working pressure and testing to 525 pounds hydrostatic pressure.

* * *

PATENT SPECIALTY SUPPLY CO., Cambridge, N. Y., manufacturer of chaplets and other specialties, has succeeded the U. S. Chaplet & Supply Co., New York, and the New York office of the latter has been discontinued. Business formerly transacted at the New York office now is handled at the Cambridge offices.

* * *

ALLIS-CHALMERS MFG. CO., Milwaukee, set a new high record in employment with a payroll of 9400 at the middle of April, exceeding the wartime peak by approximately 200. This includes all plants of the company, and the Monarch tractor division at Springfield, Ill. The main works in West Allis is employing at present 6300 people.

* * *

TREADWELL ENGINEERING CO., Easton, Pa., has entered into an arrangement for manufacturing the line of ash, coal, gravel and other bulk material handling and storage equipment developed by Eugene Hahn, production to be by the Hahn division, Easton. Mr. Hahn now is associated with the Treadwell Engineering Co. in connection with this business.

* * *

YOUNG RADIATOR CO., Racine, Wis., manufacturer of engine cooling radiators for power units, trucks and other motors, and heating units for factories, reports a satisfactory gain in first quarter over the same period of 1929. The stamping department is to be enlarged and additional equipment has been ordered. The scope of production is to be enlarged by this means.

* * *

WILLIAM K. KLEMP CO., 3341 South Western avenue, Chicago, manufacturer of metal lanterns and steel gratings, has a site at Melvina avenue and Sixty-sixth place in the Clearing, Ill., industrial district, with a building containing 12,000 feet of working space. The company owns an additional 20,000 square feet of ground at the location, which is served by the Chicago Belt Line railroad.

* * *

INLAND STEEL CO., Chicago, has increased its payroll at its Milwaukee sheet mills by providing a 5½-day working week for approximately 700 employes. Since Jan. 1, the mill, in order to avert layoffs, kept its personnel intact by operating 24 hours a day, each worker averaging about four days a week. Improvement in business has made it possible to return to the 5½-day week, continuing the three daily 8-hour shifts.

* * *

VIRGINIA State Chamber of Commerce has issued a foreign trade directory of the state, containing the names of more than 600 Virginia firms engaged in foreign trade. It contains separate lists of exporters and importers and commodities exported and imported. Another new publication by the chamber is a collection of studies of export and import commodities moving through the port of Hampton Roads. Both are available on request to the chamber, at Richmond.

Freight Traffic Falling Below 1929

Volume of freight traffic handled by Class I railroads in February was 34,340,775,000 net ton miles, according to the bureau of railway economics. Compared with February, 1929, this was a reduction of 3,798,996,000 net ton miles or 10 per cent, and a reduction of 1,382,063,000 net ton miles or 3.9 per cent under February, 1928.

Volume of freight traffic handled by the Class I railroads in the first two months of 1930 was 71,062,160,000 net ton miles, a reduction of 6,287,247,000 net ton miles or 8.1 per cent under the corresponding period in 1929 and a reduction of 949,472,000 net ton miles or 1.3 per cent under the corresponding period in 1928.

Carriers Oppose Seamen's Rule on Great Lakes

Washington, April 15.—Shipping of iron ore, coal, grain and other commodities on the Great Lakes would be seriously interfered with if the Seaman's act is extended to apply to the lakes as proposed, according to the Lake Carriers' association. Newton D. Baker, counsel for the association, appeared before the senate commerce subcommittee Monday and argued against the amendment.

The La Follette bill would require the appointment of shipping commissioners in all of the 72 lake ports, whereas there are only 14 for the entire ocean coast line of the country. Mr. Baker pointed out the difference in the character of ocean and Great Lakes shipping, referring to the latter as a ferry service compared with ocean transportation. "It is not as though seamen were leaving their homes and country for foreign shores," he said. All seamen would have to be signed on and paid off before commissioners, imposing an unnecessary obstacle and delaying service.

Steel Group Refuses Mediation Offer

New York, April 15.—The offer of former Gov. Alfred E. Smith to mediate the controversy between the Structural Steel Board of Trade of New York and the International Association of Structural and Ornamental Iron Workers has been refused by the board.

Governor Smith, president of Empire State Inc., erecting an 85-story office building here, let the contract for the structure without knowing of the controversy between the steel erectors of New York and the union. The contract for the Empire State building was placed with Post & McCord, operating open-shop, by the general contractors Starrett Bros.

J. & L. Tonnage Leads River Steel Shippers

Pittsburgh, April 15.—Jones & Laughlin Steel Corp. sent its one hundredth tow of steel products down the Ohio river today. About 500,000 tons of steel has been included in the 100 tows by Jones & Laughlin since the first steel tow was dispatched in October, 1921. Two tows a month have been sent since 1928 to the company's warehouses at Cincinnati and Memphis, Tenn., from whence further shipments by rail are made frequently.

The Carnegie Steel Co., Pittsburgh Steel Co., and Wheeling Steel Corp. are also large users of the river now in the movement to the South and Southwest. Total shipment of all products over the Ohio river in the Pittsburgh district, from Pittsburgh to Beech Bottom Run, W. Va., last year was 11,981,000 tons, an increase of almost 1,000,000 tons over 1928.

Stoker Sales on Rise

Washington, April 15.—Ten leading makers of mechanical stokers reported to the department of commerce total sales of 85 units in March, a considerable rise over the preceding month and the highest since November, 1929. However, the total was lower than March, 1929. An upward trend is exhibited from the following monthly figures:

1929	Stokers sold	Fire tube boilers	Water tube boilers
January	97	36	61
February	80	26	54
March	117	42	75
April	141	41	100
May	174	64	110
June	203	82	121
July	186	88	98
August	199	94	105
September	155	71	84
October	178	89	89
November	107	43	64
December	79	30	49
Total (year)	1,716	706	1,010
1930			
January	53	24	29
February	73	26	47
March	85	45	40

Truck Shipments Up

Washington, April 15.—March shipments of electrical trucks and tractors in both the domestic and foreign classes rose over February, as reported to the department of commerce by ten leading manufacturers in the industry. The total, while registering a gain, does not reach the mark of March, 1929, nor of January, 1930. Figures by months follow:

		Shipments	
1929	Total	Domestic	Export
January	152	133	19
February	134	131	3
March	211	201	10
April	194	181	13
May	211	202	9
June	201	185	16
July	168	163	5
August	154	144	10
September	158	151	7
October	167	134	33
November	118	110	8
December	151	124	27
Total (year)	2,019	1,859	160
1930			
January	140	123	16
February	113	106	7
March	123	109	14

National Steel Corp. had total assets as of Dec. 31, 1929, of $120,828,758, including $6,855,847 cash.

Sale of Sheet & Tube to Bethlehem Approved

(*Concluded from Page* 90)

will remain, but Bethlehem has given its word that Sheet & Tube will become a separate entity within Bethlehem, occupying the position of a subsidiary."

As to when the remaining legal matters will be cleared away, finally to permit proceeding with the actual merger, is a guess, but it may be months. Some talk of a compromise is heard whereby the Eaton-Otis holdings will be purchased by others; but this has not been verified. Under the original terms of the merger agreement the consummation of the deal was to have been accomplished by April 30. However, there remain the legal complications.

The annual meeting of the Sheet & Tube company has been set for April 22, when directors will be chosen. It is said there is a move discussed by the Eaton group whereby they may seek to have several members elected to the board.

Merger Rumors Revived

Cleveland, April 15.—As interest in the Bethlehem-Sheet & Tube merger subsides, rumors of other mergers are being revived.

Cyrus S. Eaton and associates, who are heavily interested in the Gulf States Steel Co. and who will consider incorporating it with the new Republic Steel Corp. in the fall, are again reported more actively discussing the role the Colorado Fuel & Iron Co. would play with their other properties.

In Cleveland it still is thought only a matter of time before the mutual interests in the Corrigan, McKinney Steel Co. and Otis Steel Co. are joined.

Control of the Otis company now rests with O. P. and M. J. Van Sweringen, of railroad fame. It is believed that their interest in the company is to further Cleveland's position in the industry, and any disposition of the company will hinge upon this condition.

There is more activity in the stock market in the Newton Steel Co., in which the Mathers have an interest.

Completing New Mills

Birmingham, Ala., April 15.—Gulf States Steel Co. will place its new sheet mill, in operation July 1, a month earlier than expected. The plate mill will be completed about June 1.

Industrial Men in the Day's News

Samuel N. Summer, New President, Institute of Scrap Iron and Steel Inc.

AT THE age of 46 he is president and treasurer of one of the largest scrap iron and steel companies in the country.

NOW as president of the two year old organization of scrap dealers he will find increased scope for the exercise of his executive ability.

A GRADUATE of Ohio State university, he has been a tireless worker in various alumni activities, aiding greatly in 1920 in raising its $1,088,000 stadium fund.

GUIDING the financial destinies of the Joseph Schonthal Co., Columbus, O., important scrap iron and steel interest, for 20 years equips Samuel N. Summer with a background of experience which should stand him in good stead in the enlarged field of activity now opening up to him as president of the Institute of Scrap Iron and Steel Inc., whose headquarters are in the Salmon Tower building, 11 West Forty-second street, New York, and of which Benjamin Schwartz is director general. Mr. Summer's election to the presidency for the ensuing year at the second annual meeting of the organization held at Stevens hotel, Chicago, March 4 to 6, was noted in IRON TRADE REVIEW of March 13.

His identification with the Schonthal company goes back farther than 20 years, however. He has been with it continuously since 1906, giving him almost a quarter century experience in the solution of the problems of the scrap industry, now considered the woof of the country's steel industrial fabric as pig iron is its warp.

Mr. Summer was born in Shelby, O., June 12, 1884, and was graduated from the high school there in 1901. He entered Ohio State university, Columbus, in 1901 and was graduated four years later with a bachelor of arts degree. In 1906 he became identified with the Schonthal company and was elected its secretary-treasurer in 1910. He continued to serve in those capacities until the present year when he was elected president and continued in the treasurership.

His post graduate activities for Ohio State have been numerous. He was chosen in 1920 to be general chairman of a campaign committee to raise by popular subscription a million dollar stadium fund, which campaign was entirely successful, since under his leadership a fund of $1,088,000 was subscribed. In 1922 he was elected by the alumni of the university as their representative on the athletic board of control of the college. He since has been elected to that body three times and at present is a member. Since 1924 he also has been chairman of the finance committee of the athletic board of control.

Among his numerous outside interests are included the Springfield Suburban Railroad Co., Springfield, O., of which he is president, and the West Virginia Rail Co., Huntington, W. Va., which he serves as vice president. He also is director of the Huntington National bank, and the Huntington Securities Corp., both of Columbus, and always has taken an active interest in various charitable organizations.

In addition to golf, he is greatly interested in music and art, all three hobbies serving to occupy his leisure.

Men of the Industry

JAMES P. ALLEN, who retired last October as president and general manager of the Union Steel Casting Co., Pittsburgh, which offices he had filled since 1918, has been elected a director and sales department counsel of the Machined Steel Casting Co., Alliance, O. Mr. Allen is a director of the Blaw-Knox Co., Blawnox, Pa., and a director and member of the executive committee of the Pittsburgh Rolls Corp., Pittsburgh.

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P. T. Brocklebank has been appointed general superintendent of the Mount Vernon, Ill., plant of J. P. Devine Co., Buffalo, manufacturer of chemical mixing machinery.

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A. L. Whiteside has been placed in charge of the recently-established office at New York of Hill Clutch Machine & Foundry Co., Cleveland, producer of gray iron and semi-steel castings, special machinery, etc.

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A. L. Humphrey, president, Westinghouse Airbrake Co., Wilmerding, Pa., and Caleb S. Bragg, president, Bragg-Kleisrath Corp., have been elected directors of Bendix Aviation Corp. to succeed C. M. Keys and J. C. Wilson, resigned.

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S. W. Case was recently appointed Los Angeles district manager in charge of sales and service for the Bristol Co., Waterbury, Conn., manufacturer of recording, indicating and control instruments.

W. H. Rogers was made sales and service engineer at Los Angeles.

* * *

Frank A. Miller of the Buckeye Steel Castings Co., and Frederick Mirick of F. O. Schoedinger Co., Columbus, O., have been appointed to serve as arbitrators in Columbus commercial disputes, submitted to arbitration under rules of American Arbitration association, of which Lucius R. Eastman is president.

* * *

C. M. McLean has been elected chairman of the board of Holland Furnace Co., Detroit and Holland, Mich., to succeed W. H. Beach, retired. A. H. Landwehr, formerly president, treasurer and general manager, remains as president, relinquishing his duties as treasurer and general manager. A. W. Wrieden, formerly advertising manager, was elected treasurer and director. C. H. Landwehr becomes vice president and general manager. Thomas H. Marsilje was elected a director.

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Robert P. J. McCarty has been placed in charge of the New England office at 265 Church street, New Haven, Conn., established by Associated Alloy Steel Co. Inc., Cleveland, agent for corrosion-resisting steels manufactured by Ludlum Steel Co., Sharon Steel Hoop Co., and Timken Steel & Tube Co.

A. W. DANIELS

Who, as noted in IRON TRADE REVIEW of April 10, was elected vice president in charge of sales, American Manganese Steel Co., Chicago.

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Ernest T. Weir, chairman of the National Steel Corp., Pittsburgh, has been elected a director of the Fidelity Title & Trust Co., Pittsburgh.

* * *

Fred H. Lucas has been appointed a structural engineer for Illinois Steel Co. sales department, and is now located at the Chicago headquarters, 208 South La Salle street. Mr. Lucas was continuously in the employ of American Bridge Co. from 1914 to 1928, except during the war when he served as captain in the United States army machine gun corps. From 1928 until a short time ago he was contracting engineer for McClintic-Marshall Co., in Chicago.

* * *

Tom Girdler, as noted on Page 102 of IRON TRADE REVIEW of April 10, is the chairman of Republic Steel Corp., the name style adopted for the merged Republic Iron & Steel Co., Central Alloy Steel Corp., Donner Steel Co. Inc., and Bourne-Fuller Co. Mr. Girdler formerly was president of Jones & Laughlin Steel Corp., but latterly, member of the advisory committee, Continental Shares Inc., Cleveland.

Other officers follow: President, Elmer T. McCleary, former president of Republic; first vice president, Benjamin F. Fairless, former president and general manager of Central Alloy; vice president in charge of sales, Harry T. Gilbert, formerly vice president and director of Republic; vice president in charge of operations, R. J. Wysor, formerly general manager, Jones & Laughlin Steel Corp., but since October, 1929, identified with Continental Shares and director since November, 1929, of Donner; vice president, Rollin S. Hall, former president of Bourne-Fuller; vice president, William T. Witherow, former president of Witherow Steel Corp.; secretary, Richard Jones Jr., formerly secretary of Republic; and treasurer, John U. Anderson, formerly treasurer of Republic.

The board of directors headed by Messrs. Girdler and McCleary and by John A. Topping, formerly chairman of the Republic board and a director of Bankers' Trust Co., New York, also includes: William G. Mather, president of Cleveland-Cliffs Iron Co., chairman of Otis Steel Co. and president of Corrigan, McKinney Steel Co.; Myron A. Wick, president of Steel & Tubes Inc. and member of executive committee of former Republic company; Philip Wick, former director of both Republic and Central Alloy companies; John T. Harrington, president of Pennsylvania-Ohio Power & Light Co. and a director of Pennsylvania-Ohio Edison and Allied Power & Light companies; Paul Llewellyn, president of Interstate Iron & Steel Co., Chicago; F. J. Griffiths, former chairman of Central Alloy; Jacob F. Schoellkopf Jr. vice president and director of Schoellkopf, Hutton & Pomeroy Inc., and former

director of Donner, also identified with Niagara Hudson Power, Insurance Shares, Continental Shares and Great Lakes Portland Cement companies; George M. Humphrey, president of M. A. Hanna Co. and former Republic director, and chairman of the executive committee, National Steel Corp., as well as its vice president; Edward B. Greene, chairman of executive committee, Cleveland Trust Co., Cleveland, and a director of Cleveland-Cliffs, and Goodyear Tire & Rubber Co., and former director of Republic and director of the Cliffs Corp.; Frank H. Hobson, vice president, Cleveland Trust Co. and Continental Shares and director of Lehigh Coal & Navigation Co. and former director of Central Alloy; Charles F. Glore, Field, Glore & Co., Chicago, and director of Montgomery Ward & Co., and Bucyrus-Erie Co.; and Boyleston A. Tomkins, vice president and director, Bankers' Trust Co., formerly director of Central-Alloy; and director, Detroit Edison Co., Detroit, and North American Aviation Inc.

Alex E. Walker, formerly assistant general sales manager of the Republic company, was appointed assistant vice president in charge of sales for the new Republic corporation.

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Frederik Wille, chief engineer, H. A. Brassert & Co., Chicago, has sailed for England on a business trip.

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Theodore W. Robinson, vice president of Illinois Steel Co., Chicago, will sail April 19 for a trip to Italy.

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William A. Ingram, secretary and treasurer of Taylor-Wharton Iron & Steel Co., High Bridge, N. J., resigned effective March 31. Lewis N. Aller, assistant secretary and treasurer, has been elected to succeed Mr. Ingram.

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L. R. Tierney, for more than 12 years associated with Rogers Brown & Crocker Bros. Inc., formerly Rogers Brown & Co., Boston, has resigned to become affiliated with Mystic Iron Works, Boston. His headquarters will be in New York.

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Lewis H. Reid has been made chief engineer in charge of research and development for Magnetic Analysis Corp., 42 Twelfth street, Long Island City, N. Y. He formerly was chief metallurgist for American Cirrus Engine Co., Marysville, Mich.

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George M. Verity, chairman, American Rolling Mill Co., Middletown, O.; F. A. Merrick, president, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; W. L. Mellon, chairman, Gulf Oil Corp., Pittsburgh; and Jerome J. Hanauer, Kuhn, Loeb & Co., New York, were re-elected directors of Westinghouse Electric & Mfg. Co. for four years ending April, 1934.

* * *

T. M. Rees is now affiliated with the staff of Manning, Maxwell & Moore Inc., New York, and has been appointed manager in the Pittsburgh district in charge of sales of Putnam machine tools and Shaw electric cranes. In this capacity Mr. Rees will assist the firm's Pittsburgh representative, Arch Machinery Co., and also direct the sales of men assigned in that territory.

Mr. Rees has been active in the Pittsburgh district for approximately

T. M. REES

17 years. For 10 years he was associated with Motch & Merryweather Machinery Co. and for two years was Pittsburgh district manager for the Treadwell Engineering Co. From 1925 to 1928 he was connected with Manning, Maxwell & Moore Inc., Pittsburgh, and since the Arch Machinery Co. was founded in 1928 he has been its vice president.

* * *

H. W. Noble, who as noted in IRON TRADE REVIEW of April 10, has been made New York sales representative of Box Crane & Hoist Corp., Philadelphia, to succeed Arthur Appleton, retired, has been affiliated with the Box corporation for eight years, the first five in the purchasing department and the remaining three as Philadelphia district sales representative.

Mr. Appleton had long been affiliated with the crane industry being associated originally in 1889 with William Sellers & Co., Philadelphia, cranes and machine tools. In 1906 he became connected with the Pawling & Harnischfeger Corp. and in 1912 resigned to represent the Toledo Bridge & Crane Co., Toledo, O., in the New York district, where he remained until the company was acquired by Austin Machinery Co. During that period he represented the Roper Crane & Hoist Corp., Reading, Pa., and in 1919 the Reading Chain & Block Corp., which in 1925 became affiliated with the Box corporation. Mr. Appleton will sail early in May for a trip to England and continental Europe.

* * *

Roy D. Gwynne, formerly in charge of the gas division, Jos. Greenspon's Sons Iron & Steel Co., St. Louis, has returned to the Tulsa, Okla., office as manager of pipe sales.

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Orville Coppage, identified with the Quick Welding & Machine Co., Terre Haute, Ind., for some time, was elected president at a recent meeting of stockholders. M. L. Leek is vice president and V. O. Ferran secretary-treasurer.

* * *

William T. Kyle has resigned as general sales manager of Page Steel & Wire Co., Bridgeport, Conn., effective May 1. He has been elected president of Welding Engineering & Research Corp., 30 Church street, New York, which specializes in scientific and practical development of welding.

* * *

Charles P. Burgess has resigned from the sales department of Ludlum Steel Co., Dunkirk, N. Y., to become actively engaged as an officer and director of Radiator Shares Corp. and Dunkirk Radiator Corp., with plants in Dunkirk and Utica, N. Y. Mr. Burgess located in Dunkirk in 1908, and, with his father, founded the original Atlas Steel Works. In 1912 he became first secretary of the incorporated company, Atlas Crucible Steel Co., and served as a director and in various official capacities until the present time. During the World war he was vice president and production manager and under his regime, as head of operations, the present large plant was constructed. Mr. Burgess was a principal figure in the reorganization of 1925, becoming vice president and sales manager, and since the merger with Ludlum Steel Co., he has taken the lead in connection with the co-ordination of Ludlum-Atlas sales activities. The reorganization following the merger gave Mr. Burgess enlarged opportunities, involving his removal from the city, but his new affiliations will enable him to remain in Dunkirk.

India Shipping Pig Iron to Britain

Competition Becoming Keener in European Markets—Germans Reported Cutting Syndicate Prices—New Australian Tariff Checking Shipments

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, April 15.—(*By Radio*)—Business in the British iron and steel markets continues dull and conditions on the Continent also are quiet. Indian basic pig iron is appearing in the British market, while Belgians offer iron bars at £6 5s ($30.38), delivered. Domestic orders are fair but a large share of the export business is influenced by the new Australian tariff and political disturbances in India. The Australian tariff also is an adverse factor for structural steel manufacturers in the Middlesbrough district. Tin plate mills have received good orders from Spain and France, but complain that Japanese business is going to America.

Production of pig iron in Great Britain in March totaled 665,800 tons, compared with 597,000 tons in February, and 590,500 tons in March, 1929. The number of stacks in blast March 31 was 157, five less than Feb. 28. Output of steel ingots and castings in March amounted to 826,100 tons, compared with 776,400 tons in February, and 859,900 tons in March, 1929.

IRON TRADE REVIEW'S correspondents at Paris and Brussels report diminishing activity in the markets. Iron and steel producers in Luxemburg are slowing operations. The markets in Germany are dull, some products being exported below prices agreed on by syndicates. An order has been booked for 16 locomotives and 17 boilers for shipment to India.

Continental Price Cut Lowers British Iron

LONDON, April 3.—(*European Staff Service*)—Dull conditions continue in export iron and steel markets, with no definite signs of revival. A falling-off of business is general in all producing countries and is part of the general uncertainty of trade the world over. Prices quoted are at or near the level fixed by the international associations recently formed on the continent, and no changes have been made recently.

The only product showing any serious fluctuations is pig iron. The agreement that holding producers of France, Belgium and Luxemburg appears to have broken down momentarily. This entente has recently been strengthened. Foundry pig iron, which was quoted for many months at £3 12s 6d ($17.60) f.o.b. Antwerp, now has been adjusted to £3 4s 6d ($15.60), after having reached the low level of £3 2s ($15.05), this price being quoted for shipment to Great Britain. Incursions of continental pig iron in the north of England have been noticed, and this has no doubt influenced British furnace operators in Middlesbrough to reduce the price from £3 12s 6d ($17.60) to £3 5s ($15.80). British steel works are experiencing keen competition from the continent.

Several interesting contracts calling for the use of steel have been received by a number of British engineering firms; among the more recent are an order for 7 all-steel single-seater airplane fighters for the Latvian government, and 12 similar machines for the Esthonian government, received by the Bristol Aeroplane Co. Ltd.; contracts for a mo-

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 14	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$16.40	3 7 6*	$16.28	3 7 0	$16.28	3 7 0	$16.28	3 7 0
Basic-Bessemer	15.92	3 5 6†	15.07	3 2 0	15.07	3 2 0	15.80	3 5 0
Hematite, Phosphorus 0.02-0.05	18.23	3 15 0	24.63	630*	.....	.....	17.74	3 13 0
SEMIFINISHED STEEL								
Billets	$29.77	6 2 6	$22.84	4 14 0	$22.84	4 14 0	$22.89	4 14 0
Wire rods	41.31	8 10 0	30.38	6 5 0	30.38	6 5 0	30.43	6 5 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.65	6 10 0
Merchant bars	1.74c	8 0 0	1.18c	5 7 6	1.18c	5 7 6	1.17c	5 6 0
Structural shapes	1.68c	7 15 0	1.12c	5 1 6	1.12c	5 1 6	1.12c	5 1 6
Plates, ship, bridge and tank	1.79c	8 5 0	1.44c	6 10 6	1.44c	6 10 6	1.49c	6 15 0
Sheets, black, 24 gage	2.17c	10 0 0	2.26c	10 5 0	2.26c	10 5 0	2.33c	10 12 0
Sheets, galvanized, 24 gage, corrugated	2.47c	11 7 6	2.57c	11 13 9	2.57c	11 13 9	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.29c	5 17 6	1.29c	5 17 6	1.29c	5 17 6
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.51c	6 17 0
Galvanized wire, base	3.04c	14 0 0	1.76c	8 0 0	1.76c	8 0 0	1.87c	8 10 0
Wire nails, base	2.39c	11 0 0	1.46c	6 12 6	1.46c	6 12 6	1.49c	6 15 0
Tin plate, base box 108 pounds	$4.43	0 18 3	.....	.....	.....	.....	$ 8.99	1 17 0

*France

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.40	3 7 6	$19.16	490(2)	$17.30	620	$20.29	85
Basic pig iron	15.92	3 5 6	20.53	525(1)	15.07	540	21.72	91
Furnace coke	3.89	0 16 0	6.57	168	6.28	225	5.13	21.50
Billets	29.77	6 2 6	24.24	620	22.60	810	28.88	121
Standard rails	1.79c	8 5 0	1.46c	810	1.73c	1,330	1.51c	140
Merchant bars	1.74c	8 0 0	1.27c	705	1.25c	965	1.52c	141
Shapes	1.83c	8 10 0	1.26c	700	1.22c	940	1.50c	138
Plates, ship, bridge and tank	1.95c	9 0 0	1.46c	810	1.52c	1,170	1.71c	158
Sheets, black, 24-gage	2.28c	10 10 0	2.72c	1,510	2.60c	2,000	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.58c	11 17 6	3.56c	1,975	3.25c	2,500	3.78c	350
Plain wire	2.06c	9 10 0	1.94c	1,075	2.15c	1,650	2.43c	225
Bands and Strips	2.17c	10 0 0	1.44c	800	1.50c	1,150	1.77c	164

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 14s 0d ($3.40) f. o. b. Ferromanganese £19 6s 0d ($93.99) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($73.05) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

tor passenger and cargo vessel for a South American company, a cargo vessel of moderate size for Bergen (Norway) owners, and a 9500-ton motor tanker for Norway, passed to British shipyards; sixteen narrow-gage bogies for the South African railways and harbours board, awarded to Head, Wrightson & Co. Ltd., Thornsby-on-Tees; a contract for coal-cleaning and grading plant for Upper Silesian and Polish coal mines, received by the Birtley Iron Co. Ltd.

An interesting development in Germany is the trade treaty just signed with Poland, enabling Poland to export into Germany a tonnage of rolled steel products equivalent to one half of 1 per cent of Germany's total domestic sales. This tonnage will amount to about 50,000 tons per year. Conversely, Germany is allowed to export into Poland only such steel as Poland does not produce herself. Germany undertakes to supply Poland with 165,000 tons of scrap per year. It is expected the signing of this treaty will bring to an end the long period of uncertainty prevailing between the two countries and which has proved a considerable obstacle to normal trade. While domestic business in Germany continues dull, there has been some export inquiry for semifinished steel, especially from Great Britain. There also has been demand for structural steel for bridge construction. For Japan, 30-gage sheets have been quoted at £12 5s ($59.40) f.o.b. port of shipment.

From Brussels it is confirmed that iron and steel export business is slow, but makers find enough orders to keep them going. At a meeting held in Paris the following prices for exports of foundry pig iron were fixed: For Great Britain, £3 4s 6d (15.60); for Italy, £3 2s ($15); for overseas countries, £3 7s ($16.20); for Switzerland, 82 Swiss francs ($15.80); all f.o.b. port of shipment. The most active department is that of semifinished steel, especially billets. British competition in galvanized corrugated sheets is less noticeable. The wire nails market is practically lifeless.

In France, business is slackening. Export trade is dull, but mills still are sufficiently covered by domestic orders.

Belgian Tonnage Lower

Brussels, April 3.—(*European Staff Service*)—Iron and steel production in Belgium in February showed an all-round drop. The output of steel ingots and castings in February was composed of 311,380 tons of ingots and 10,100 tons of steel castings. Output of finished steel was also below that of January. Comparisons follow, in metric tons:

Mon. ave.	Coke	Act. Furn.	Pig iron	Steel ingots and castings	Finished steel
1913	294,000	....	207,055	205,550	154,920
1927	448,880	....	312,620	309,040	255,185
1928	493,885	....	325,445	327,870	281,125
1929	498,700	58	341,330	344,370	296,370
1930					
Jan.	505,990	58	343,380	340,200	296,220
Feb.	451,680	57	315,320	321,480	271,430

Belgian Steel Market Dull as World Buying Continues Slack

BRUSSELS, April 3.—(*European Staff Service*)—The tone of the Belgian iron and steel market is quiet. New orders are scarce, and it clearly appears that business is difficult. Exporters complain they are receiving only a few inquiries from abroad as a consequence of poor financial conditions the world over. South America is not buying intensively, but it would not be surprising if a revival of that market were at hand; in fact, some tonnages of special setcions, particularly for window frames and shutters, have been ordered. Orders from the Far East are scarce, and it is known that India and Japan are organizing their production to be in a position to manufacture as many commodities as they can, so as to be independent. This is the case for wire products, and it has recently been announced that a continuous wire rod mill soon will be installed in Japan, the output of which will be 25,000 tons.

With regard to the steel entente and the various organizations which it controls, the topic of the week has been reconstitution of the international entente for the sale of phosphorus pig iron between producers of France, Belgium and Luxemburg. Prices will be as follows: For delivery into England, £3 4s 6d ($15.69) f.o.b. Antwerp; for overseas countries, £3 7s ($16.30); for Holland, £3 7s 6d ($16.42) f.o.t. Dutch border; for Italy, £3 2s 6d ($15.20) f.o.t. Thionville or £3 6s ($16.06) f.o.b. Antwerp; for Austria, £3 5s ($15.81); for Switzerland, 82 Swiss francs ($15.80) f.o.t. Bale, tariff duties unpaid. The entente is encountering serious difficulties in the organization of the skelp market, as many British works want to buy where they like.

Semifinished products are inactive, but commitments of Belgian works seem to be important. Prices remain unchanged. The market for finished material is quiet, but demand for beams is increasing. Delays of delivery vary with the works. The Providence concern indicates five months, whereas other concerns seem to have only 15 days' work.

The international wire rod syndicate has fixed the program for second quarter at 500,000 tons. Prices are unchanged, £6 5s ($30.41) f.o.b. Antwerp for 5-millimeter and 5½-millimeter wire rod and £6 10s ($31.63) f.o.b. Antwerp for 8½-millimeter to 13-millimeter wire rod.

It has not been possible to come to an agreement between the English association of steel merchants and the entente, consequently they are considered as ordinary buyers and no rebate can be granted them.

French Output Drops

Paris, April 3.—(*European Staff Service*)—A substantial drop was registered in output of pig iron and steel in France in February. The February total comprised 609,000 tons of basic bessemer, 109,000 tons of phosphorus foundry, 7000 tons of semi-phosphorus, 34,000 tons of hematite foundry, 36,000 tons of hematite refining pig iron, and 15,000 tons of ferroalloys.

February output of steel ingots and castings included 752,000 tons of ingots and 21,000 tons of steel castings. From the point of view of composition, the February output was composed of 537.000 tons of basic bessemer, 213,000 tons of open-hearth, 8800 tons of acid bessemer, 1200 tons of crucible and 13,000 tons of electric steel. Comparative figures follow, in metric tons:

Mon. ave.	Act. Fur. on last day	Pig iron	Steel ingots and castings
1913	131	433,940	390,580
1927	142	774,785	689,610
1928	153	841,415	782,995
1929	156	870,000	805,500
1930			
Jan.	156	875,000	800,000
Feb.	154	810,000	800,000

German Output Lower

Berlin, April 3.—(*European Staff Service*)—The output of pig iron in Germany in February was markedly less than in January. The February output included 613,093 tons of basic bessemer, 179,259 tons of ferroalloys, 101,121 tons of foundry, 68,706 tons of hematite, 2035 tons of gray forge pig iron and 303 tons of direct castings.

The February output of steel ingots and castings was composed of 1,153,928 tons of ingots and 22,497 tons of steel castings. The ingot production included 600.876 tons of basic open-hearth, 528,869 tons of basic bessemer, 11,538 tons of acid open-hearth, 9783 tons of crucible and electric steel, and 2872 tons of ingot iron. Comparisons follow, in metric tons:

Mon. ave.	Furnaces on last day	Pig iron	Steel ingots and castings	Finished steel
1913*	.....	909,640	993,640	970,240
1927	116†	1,091,875	1.359,225	1,069,930
1928	101†	984,700	1.209,770	880,690
1929	95†	1,116,730	1,353,820	940,425
1930				
Jan.	95	1,092,206	1,275,023	896,076
Feb.	93	964,517	1,176,435	797,899

*Present boundaries.
†Last day of year.

Plan 1200-Ton Stack

Berlin, April 3.—(*European Staff Service*)—It is announced from Essen that the Vereinigte Stahlwerke, or United Steel Works Corp. of Germany, has decided to erect a blast furnace stack of 1200 tons capacity at the works of August Thyssen at Hamborn. It is believed this new stack will be ready to start operating at the end of this year. Already eight blast furnaces exist at this plant, seven of which have a maximum capacity of 700 tons, and the eighth a capacity of 1200 tons. The latter and the one which is to be built will be among the largest blast furnaces in Europe.

New Specifications for Scrap Issued

Philadelphia, April 15.—Phoenix Iron Co., Philadelphia, with steelworks and mills at Phoenixville, Pa., has issued a new specification for mixed short steel scrap against which it now is buying. This specification reads as follows:

Reasonably clean steel or wrought iron scrap, such as cut pipe (including galvanized), rods, bed, light sheet, perforated sheet, etc., weighing not less than 40 pounds per cubic foot.

Long scrap must not be over 12 inches in length and flat scrap not over 8 x 8 inches.

Galvanized sheet, galvanized conduit, cable, painted top scrap, cast iron, close packing scrap, such as rivets or punchings, will not be accepted.

No car to contain more than 20 per cent of light auto scrap.

Galvanized Ware Off

Washington, April 15.—February shipments of galvanized sheetmetal ware fell off from the preceding month, as did shipments in general. Figures for shipments and production are also much lower than February, 1929. Monthly figures follow according to reports made to the department of commerce by manufacturers comprising a large proportion of the industry:

(In dozens)

	PAILS, TUBS		OTHER WARE	
1929	Production	Shipments	Production	Shipments
Jan.	151,106	165,745	40,649	36,896
Feb.	151,019	170,813	60,471	43,329
March	211,252	211,516	50,055	49,549
April	165,155	171,722	55,778	55,632
May	176,622	150,501	43,370	38,597
June	98,857	104,762	37,479	35,334
July	105,454	109,841	42,384	44,117
Aug.	107,004	108,461	53,250	54,860
Sept.	113,698	120,297	46,594	52,970
Oct.	129,282	135,197	45,117	49,511
Nov.	102,400	90,684	32,951	30,123
Dec.	112,962	107,733	33,114	25,441
Total year	1,624,811	1,647,272	541,212	516,359
1930				
January	145,588	154,731	38,982	29,165
February	119,739	129,853	35,121	31,536

Locomotives Hold Rise

Washington, April 15.—Shipments of railroad locomotives in March reached 68 total units, practically holding the gain set in February, and the highest total set since November, 1929. The month's shipment represents a considerable rise over March, 1929, although it is to be noted that in the month just passed, unfilled orders have fallen off. The following monthly comparison is from department of commerce figures:

	Domestic Shipments			Domestic Unfilled Orders		
1929	Total	Steam	Elec.	Total	Steam	Elec.
January	23	6	6	278	251	21
February	23	20	1	339	301	20
March	35	31	4	488	419	24
April	61	57	2	495	419	24
May	99	92	2	444	362	22
June	78	58	1	552	489	21
July	69	39	3	539	490	18
August	129	117	6	436	392	13
September	75	60	7	429	347	55
October	96	90	6	423	347	49
November	95	75	....	398	340	49
December	67	62	1	490	435	48
Total	850	707	39	104	.....	.....
1930						
January	48	48	....	587	527	50
February	67	60	4	533	479	46
March	68	64	2	535	485	44

Sets Yard Scrap Cost

The cost of handling and properly preparing scrap iron and steel averaged $2.65 to $2.85 per net ton in a two-year period, according to a cost study conducted by a large yard operator. This statement is contained in pamphlet on "Costs in Yard Operations," issued by the Institute of Scrap Iron and Steel Inc. to its members. The pamphlet summarizes the discussion that took place on the subject of costs at the second annual convention of the institute in Chicago March 5.

The paper read by Mr. B. P. Williams, vice president of Hickman-Williams & Co., St. Louis, stated that there is a constant cost that must be figured with every ton of scrap iron and steel before it is put into the process of preparation. This constant cost should be approximately $1.85 per ton before the shear or torch has touched the material, and should include such items as switching to the yard, unloading, loading, deduction of 2 per cent on account of dirt, interest, overhead and billing in and out.

Admitting that each yard and each carload of scrap probably has a different cost, Mr. Williams submitted figures showing the experience of his company, which are close to those of others and probably represent a fair average. For cranes he finds an hourly cost of $4.48 on the basis of 2200 useful working hours per year. For derricks the hourly cost is $1.81½, for cutting burners $1.38½, and for shears $2.18½ for the large and $1.59 for the small. Items considered in making these costs include labor, insurance, coal, depreciation, repairs, water, oil, interest and miscellaneous.

W-K-M Co. Inc., Houston, Tex., oilfield and industrial equipment, has increased capital to $900,000 and plans to enlarge its facilities.

Canada Steel Reports Better Earnings

Toronto, Ont., April 15.—The annual financial statement of the Steel Co. of Canada Ltd., Hamilton, Ont., showed total earnings of $5,335,256. Net profits after all deductions were $3,538,267, compared with $2,783,395 for the previous year. This was disposed of as follows: Dividends paid and reserved for preference shares, $454,741; ordinary shares, $805,000; benefit fund $200,000 and pension fund $100,000, leaving a net surplus of $1,978,526.

The report of the directors stated that the ore dock will be ready to operate upon the opening of the new Welland canal. Other construction work in progress includes the remodeling of the fencing plant at Dominion works, Lachine, and the erection of a new plant for the manufacturing of galvanized wire fencing at Canada works, Hamilton. The distribution system installed at Hamilton works for the use of blast furnace gas has given excellent results. Developments in modern sheet mill practice have established units of a capacity greatly in excess of the tonnage available in the Canadian market, and prices and profits have suffered. Plans are being made for extending the operations of the company in the manufacture of seamless tubing.

Enameled Ware Holds

Washington, April 15.—Total shipments for February of enameled sheet-metal ware practically held the mark set the preceding month. February's total, as reported to the department of commerce by manufacturers comprising 80 per cent of the industry, was 331,915 dozen valued at $1,256,369. Comparisons by months follow, with some revisions being noted for January:

In Dozens

1929	Total	White	Gray	Colored
Jan.	427,871	199,589	138,480	89,802
Feb.	390,577	178,589	131,206	80,782
March	449,425	183,191	166,368	99,866
April	463,577	194,971	137,764	130,842
May	352,885	156,195	109,165	87,525
June	337,375	147,285	89,919	100,171
July	290,532	127,058	90,454	73,020
Sept.	338,169	143,505	101,127	93,537
Oct.	371,292	158,138	112,391	100,763
Nov.	305,714	115,117	100,144	90,453
Dec.	391,523	103,404	107,643	180,476
Total, year	4,504,102	1,861,011	1,403,419	1,239,672
1930				
Jan.*	332,146	110,758	106,484	114,904
Feb.	331,915	120,523	93,225	118,167

*Revised.

Gray Wire Specialty Co., Cleveland, has moved into larger quarters at 2100 Abbey avenue S.W.

Obituaries

BRAINARD F. PHILLIPSON, 40, president of Climax Molybdenum Co., New York, since it was organized in 1919, died April 7. After graduating from Columbia university in 1913 with a degree in chemical engineering he became identified with American Metal Co. Ltd., New York, where he remained in various capacities until 1919, when its associate, Climax Molybdenum Co. was formed. Mr. Phillipson devoted much attention to the development of molybdenum and its applications, particularly when cessation of the war ended its use as a munition material. He was a member of American Society for Steel Treating, American Society of Automotive Engineers, American Iron and Steel institute and several other industrial organizations.

* * *

Frederick H. Deacon, 76, for many years secretary and treasurer of the Cresson-Morris Co., Philadelphia, died April 7, at his home in Philadelphia.

* * *

A. C. Weber Jr., assistant secretary and treasurer of Pontiac Pattern & Engineering Co., Pontiac, Mich., died recently following an operation.

* * *

John B. Gillie, 64, president of Tonawanda Machine Co., Tonawanda, N. Y., died April 12. He had been prominent in manufacturing enterprises of the Buffalo district for many years.

* * *

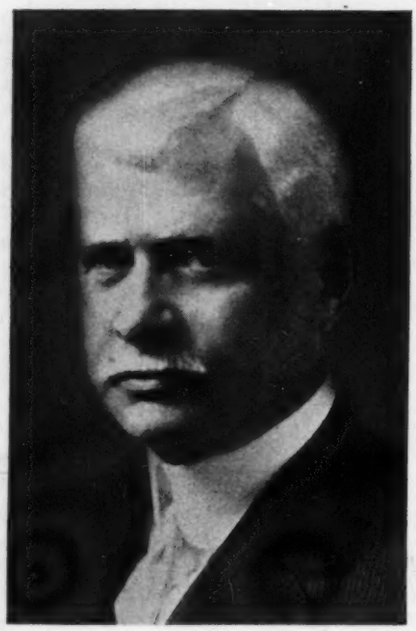
William Wilke, 75, former assistant chief engineer in the Midvale Steel Co. organization, died recently at his home in Buffalo, where he had resided since retirement.

* * *

John Kreusi, president of the American Lava Corp., Chattanooga, Tenn., and a son of the late John Kreusi of Schenectady, N. Y., who was associated with Thomas A. Edison in the early days of electricity, died recently at his home in Chattanooga.

* * *

Augustus H. Bullard, whose death April 5 was briefly noted in IRON TRADE REVIEW of April 10, had been identified with Bullard Machine Tool Co., Bridgeport, Conn., since its incorporation in 1894 as secretary-treasurer, and was with its predecessor company, Bridgeport Machine Tool Works, from 1886 until 1894. In April, 1901, he was active in the formation of Bridgeport Manufacturers' association, of which he was elected corresponding secretary, and in February, 1903, he aided in forming the Connecticut Manufacturers' association. In 1905 he was elected president of the latter organization for a 2-year term and in 1910 was one of



A. H. BULLARD

its incorporators. He also was active in the work of American Anti-Boycott association, National Metal Trades association, National Manufacturers' association and National Industrial Conference board. He also was director and secretary-treasurer of Bullard Engineering Works, organized during the World war to build field artillery guns for the government.

* * *

John Oliver Arnold, 73, emeritus professor of metallurgy at Sheffield university, England, and a pioneer in development of high-speed steel, died March 28. As a young man he entered naval service and then became identified with the engineering department of Brown, Bayley & Dixon Ltd., Sheffield. He was awarded the Tilford premium and gold medal in 1895 and the Bessemer gold medal in 1905. During the World war, when vanadium was difficult to obtain, he developed valuable substitutes. His formula was regarded as a most important contribution to steel manufacture on both sides of the Atlantic ocean.

* * *

Robert Hutchins McNall, 64, president of Gilbert & Barker Mfg. Co., Springfield, Mass., manufacturer of gasoline pumps, station equipment, etc., and subsidiary of Standard Oil Co. of New Jersey, until his retirement more than a year ago, died at his home in New York, April 13, following a brief illness.

* * *

Clarence H. Norwood, 56, president of Norwood-Noonan Co., Chicago, electrical construction engineer, died April 12 at his home in Chicago, from heart disease. Mr. Norwood was a pioneer in the development of electrical control of bridges. For a time was associated with Cutler-Hammer Inc., was a past president of the Chicago Engineers' club and a member of the Western Society of Engineers.

* * *

William H. Miner, 69, for many years president of William H. Miner Inc., Chicago, railroad supplies, and chairman of the board of directors, Pratt & Letchworth Co., Buffalo, died April 3 in his home village, Chazy, N. Y., following a tonsil operation at a hospital at Plattsburg, N. Y. He was a director in several middle western corporations and a life member of the Art Institute of Chicago. Mr. Miner controlled a patent for a widely used car coupling device.

* * *

Alfred Brotherhood, 83, who retired 23 years ago from Manning, Maxwell & Moore Inc., New York, after establishing its machine tool department at 111 Liberty street, and developing its Shaw electric traveling crane, died April 1 at his home in East Aurora, N. Y. At the time of his death he was president of Wakefield Boiler Compound Co., and had been mayor of East Aurora for about eight years. He was born in Chippenham, England, in 1848, obtained his early mechanical training at his father's shop there, and in 1867, located in this country, becoming paymaster for Delaware & Hudson Coal Co., Plymouth,

(*Concluded on Page* 101)

Machinery

Moderate Improvement in Buying and Inquiry Noted in Chicago Territory—Other Districts Quiet—Buyers Postpone Closing

EXCEPT for a few scattered lists, machine tool buying progresses at a slow pace, moderate improvement being noted in the Chicago district but light demand holding elsewhere. In some localities sales forces have concentrated efforts on railroads with only a fair degree of success, one eastern road withdrawing a list of 15 tools. Carriers in the Middle West are delaying closing, some adding a few tools to their lists. Chicago, South Shore & South Bend railroad will buy $250,000 worth of shop equipment for its Michigan City, Ind., repair and machine shop now under construction. Export bookings, notably with the Amtorg interests, continue brisk, but it is reported builders are investigating credit conditions more carefully in this quarter.

New York, April 15.—With one or two exceptions, machine tool dealers and builders report no improvement in sales. Demand for machine equipment is light and inclined to be spotty. Sales are limited to one or two units at a time. Inquiry is fair and good in Philadelphia territory. Considerable volume of business has been figured, but buyers are slow to close. Delivery is back to normal on standard equipment with the exception of boring mills. Fourteen weeks is the best one eastern builder can do. Sales this week include two large boring mills. Some builders are stocking standard tools in a limited way. Radial drills moved this week to steel fabricators and there also has been some business in brakes. General Electric Co. is inquiring for a few tools and is reported to have increased production in the refrigeration department. General manufacturing surveys, however, find most plants operating on reduced schedules, car shops and railroad equipment plants excepted; few are actually closed.

The second quarter thus far has brought no pronounced expansion in machine tool buying. Sales forces have concentrated on railroads in some cases with limited success. The withdrawal of the bulk of the list of 15 tools by an eastern road is a discouraging factor. Several ball bearing plants are again planning to increase production, two in Connecticut having stepped up schedules. Demand for grinding machinery holds fair. One large builder is operating 40 hours a week. Little grinding machinery is being stocked since demand for this type of equipment has been steadily toward special tools and attachments. A general survey of industrial conditions in New England this week placed operations slightly better than 60 per cent. Airplane engine builders are down to skeleton forces as a rule, their outlook uncertain. Export trade remains brisk, but some builders are reported scrutinizing credit conditions closer, while others refuse to compete for some of this business. A few demand cash and in cases where equipment is produced exclusively by such manufacturers, they are getting it.

Worcester, Mass., April 15.—Machinery movements are at a low level, a tendency being noted generally to postpone buying. Export trade in grinders is encouraging but domestic transactions are few. A resumption of automotive buying is being awaited by dealers here as a stimulant for a depressed market condition.

Pittsburgh, April 15.—Machine tool sales continue to mark time with few awards noted involving more than single tools. Inquiry is slightly heavier although it includes no large lists. Both railroads and steel companies show little activity in recent buying. The crane market is quiet.

Chicago, April 15.—Machine tool sales in the Chicago district picked up moderately during the week, and indications are that the month's orders may surpass March. The St. Paul, Santa Fe, Chicago & North Western and Rock Island railroads still are delaying final closing on the major portions of their lists. Chicago & North Western is adding a 50-inch and 21-inch drill to its list. Allis-Chalmers Mfg. Co. is expected to make important purchases for its works additions at West Allis, Wis., and may buy additional equipment for its Monarch tractor plant at Springfield, Ill. Chicago, South Shore & South Bend railroad will buy about $250,000 worth of shop equipment for its Michigan City, Ind., repair and machine shop now under way. The proposed equipment will include 5 and 10-ton traveling cranes and a transfer table.

Chicago voters last Tuesday approved the bond issue for important building work and additions to the municipal flying field, and additional shop equipment will be purchased. International Harvester Co. has not issued its full inquiry list for various types of heavy equipment. A local radio manufacturer soon will be ready to purchase important equipment for a changeover to production of mechanical refrigeration units. Several sales of punch and shear equipment are reported.

Cleveland, April 15.—Some improvement in the machinery situation is voiced by dealers here, numerous scattered orders being booked, mostly for single machines. The recent machinery auction at the Stearns plant is said to have practically killed business for the past three weeks but sales are picking up gradually. Steel mills and general metalworking lines are taking a few tools; automotive business continues at low ebb. Prices are firm and deliveries good.

General Electric Orders Down Slightly

Orders received by the General Electric Co., Schenectady, N. Y., for the first quarter of 1930 amounted to $90,397,731, compared with $101,365,208 for the corresponding three months of last year, Gerard Swope, president, announced at the annual meeting of stockholders.

Sales billed for the first three months of 1930 amounted to $91,205,732.28, compared with $83,385,015.49 for the corresponding period last year. Profit available for dividends on common stock for the first quarter of 1930 was $14,398,790.52, compared with $13,862,298.06 for the same three months last year.

Obituaries

(*Concluded from Page* 100)

Pa. Later he was associated with Taylor Iron Works, Charleston, S. C., but removed to New York to establish the machine tool department for Cook & Beggs, Cortlandt street. His next connection was with Manning, Maxwell & Moore Inc. He was one of the oldest members of the Engineers' club, New York.

* * *

Frank Jerome Dutcher, who retired last June as president of Draper Corp., Hopedale, Mass., died April 12. Born in 1850, Mr. Dutcher was employed by Dutcher-Temple Co., Hopedale, in 1868. When the company was incorporated he was made treasurer and in 1897, when it merged with three other companies to form the Draper Co., he was appointed purchasing agent. He later became secretary and was elected president in 1909 when it was incorporated. He was treasurer of Milford Water Power Co., and president of Home National bank, Milford, Mass.

CONSTRUCTION *and* ENTERPRISE

Concise, Timely Business Building Opportunities from Field of Industry

East Central

CHARLESTON, ILL.—Charleston Mfg. Co. is reported planning to start soon the manufacture of auto heaters, visors and other accessories. Nate Lang is one of the company's officers.

CHICAGO—Four-story plant leased by the Western Radio Mfg. Co., 126 Westlake street, was recently damaged by fire.

CHICAGO—Chicago Car Seal Co., 364 North Green street, manufacturer of car seals, has leased a 1-story plant building at Erie and Western avenues, having sold former plant headquarters. Manufacturing will be done in the new building, 115 x 144 feet, after occupancy May 1.

SPRINGFIELD, ILL.—Part of building of Illinois Foundry Co., 2725 South Eleventh street, was recently damaged by fire at a loss estimated at $6000.

LEBANON, IND.—Indestructible Wheel Co., maker of metal disc wheels, recently acquired the metal-wheel division of the Bimel Spoke & Wheel Works, Portland, Ind., and will move physical assets to its plant here. Indestructible Wheel Co. has been undergoing an expansion program for some time and now additional expansion is planned.

ALBION, MICH.—Decker Screw Products Co. is installing equipment in a cadmium plating division of its plant here and a new building for this department is under construction.

DETROIT—Stinson Aircraft Corp. plant at Wayne airport was recently damaged by fire. Loss is estimated at $10,000.

DETROIT—Board of water commissioners, 735 Randolph avenue, has been receiving bids for a superstructure on a power, pumping and filtration plant on West Warren avenue.

DETROIT—Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman street, has awarded contract to the Austin Co., 16112 Euclid avenue, Cleveland, for a 1-story, 55 x 260-foot manufacturing plant. Cost will be $50,000 and construction has begun. Company manufactures aircraft parts, drill jig bushings, grinding spindles and diesel engine parts.

FENTON, MICH.—Industrial Machine & Tool Co. was recently reported having closed contract for shop enlargement.

GRAND RAPIDS, MICH.—Superior Foundry Co. plant, 500 Watson street, will be equipped by the Consumer's Power Co., 129 Pearl street, as a plant for rewinding motors.

HOLLAND, MICH.—Manufacturers Foundry Co., East Ninth and Fairbanks avenue, formerly the Western Foundry Co., Chicago, contemplates expansion although court litigation with city is now in process over the necessary ground.

KALAMAZOO, MICH.—Consumers' Power Co., 110 East Michigan street, Lansing, Mich., will, upon successful flotation of a bond issue, spend approximately $275,000 for plant equipment and a new substation to be constructed here.

MORENCI, MICH. — Parker Rustproof Co., 2177 East Milwaukee street, Detroit, manufacturer of chemical preparations, has started work on a branch plant addition here.

PONTIAC, MICH.—Boiler unit and cooler addition contract for Gabel-Risdon Creamery Co. has been let to H. L. Stout, 21 South Genessee street.

BELLAIRE, O.—Ohio Public Service Co., subsidiary of Henry L. Doherty Co., 60 Wall street, New York, will build a large power plant at Dilles, O., near here, reported to cost $12,000,000.

CINCINNATI—L. B. Ratliff has been granted a permit to erect a small 1-story auto repair shop at 5837 Bramble street.

CLEVELAND—Winton Engine Works, 2116 West 106 street, manufacturer of engines, is building a plant addition.

CLEVELAND—J. Rutkowski Inc., 5200 Harvard avenue, will build a 1-story machine shop to cost about $50,000.

CLEVELAND—Atlas Steel & Supply Co., 4401 Trumbull avenue, is reported having plans prepared for a 1-story machine shop costing about $50,000. M. B. Abrams is president and treasurer.

CLEVELAND—American Steel & Wire Co., 208 South LaSalle street, Chicago, subsidiary of the United States Steel Corp., will construct new facilities for its cold-rolling department at Cuyahoga works, here. Expenditure is expected to approximate $2,000,000.

COLUMBUS, O.—Buckeye Saw Mfg. Co., Chestnut and Water streets, has let contract to Moras & Leonard, contractors, for 2-story plant remodeling and alterations.

COLUMBUS, O.—Harrop Ceramic Service Co., engineer, 310 West Broad street, advises it has awarded contract to Branch Construction Co., 395 East Broad street, for a 15 x 44-foot drafting room addition. No new equipment is needed.

DAYTON, O.—City Railway Co., 200 South Western avenue, has been awarded permit for workshop alterations at the above address. Max Borm, 1721 Tuttle avenue, has the contract.

SANDUSKY, O.—City commission is understood to be having a preliminary survey made by Froehlich-Emery Engineering Co., Second National Bank building, Toledo, O., for possibilities of constructing a municipally-owned electric light and power plant.

TOLEDO, O.—Prest-O-Lite Co. Inc., manufacturer of burners, tanks and batteries, 30 East Forty-second street, New York, will start construction here soon on a plant to cost about $200,000. The company now owns a warehouse on a site here near Buckeye street and the Toledo Terminal railroad.

WESTERVILLE, O.—Bennett Mfg. Co., manufacturer of implements, harvesters and farm machinery, advises that plant being rebuilt now will include need for following machinery: Drill press, 24-inch planer, 12-inch jointer, table saw and band saw. (Noted April 10.)

YOUNGSTOWN, O.—Fire recently damaged hangars, repair shop and equipment at municipal airport, Lansdowne field here. Loss was estimated at $3500.

YOUNGSTOWN, O.—Abel Mfg. Co. which was recently incorporated with $75,000 capital to manufacture and deal in furnaces, boilers, appliances, hardware tools and machinery, is said to plan going into business soon. John S. Abel was one of the incorporators.

McMECHEN, W. VA.—Wheeling Tube Co., recently incorporated to manufacture seamless tubing, is said to have plans through George B. Cunningham, architect, Pythian building, Wheeling, W. Va., for a plant building to be located here. (Noted April 10.)

MADISON, WIS.—Governor Kohler has ratified the contract let to J. H. Findorff & Son, 601 West Wilson street, for the construction

Resale News

UNITED STATES SHIPPING BOARD is offering for sale a large volume of equipment, including cranes, and steel frame shop buildings at Hog Island shipyards, Philadelphia. Included are nine Northern Engineering Co. 25-ton overhead cranes, three McMyler-Interstate Co. 25-ton steam operated locomotive gantry cranes and shop equipment. Among buildings to be sold are plate and angle shops, machine, pipe, air tool, galvanizing shops and other structures. Bids will be received by the director of supplies, Emergency Fleet corporation, Washington, until May 9.

* * *

Plant and equipment of Texas Boiler & Tank Co., 601 North Street., Fort Worth, Tex., has been sold to creditors by court order. B. K. Issacs was trustee in bankruptcy.

of the new mechanical engineering building for the University of Wisconsin. It will be 3-story, irregular-shaped, 230 x 230 feet over all. Plans are by Arthur Peabody, state architect. M. E. McCaffrey is secretary of the Board of Regents.

MARINETTE, WIS.—At a special election April 1 a bond issue of $550,000 for the purchase of the local waterworks system by the city was adopted. Plans are for the enlargement of the pumping plant and extension of the system during the next two years. John Moore is city clerk.

MILWAUKEE—Milwaukee Electric Railway & Light Co., 217 Michigan street, is about to let contracts for the erection of a brick and steel addition, 65 x 100 feet, to the turbine room of its Lakeside steam generating plant at St. Francis, near Milwaukee. Fred H. Luber is company architect.

PARK FALLS, WIS.—Flambeau Paper Co. has engaged Orbison & Orbison, consulting engineers, Appleton, Wis., to make plans for a hydroelectric generating plant on the Flambeau river at Cowley Rapids, near here. Edward P. Sherry, 461 Jefferson street, Milwaukee, is president and treasurer of the company.

PHELPS, WIS.—Board of education is having plans drawn by Robert A. Messmer & Brother, architects, 221 Wisconsin avenue, Milwaukee, for the proposed $75,000 high school, 82 x 135 feet, with boiler room wing, 20 x 33 feet. Mrs. E. O. Olson is secretary.

TWO RIVERS, WIS.—City commission, care E. J. Donnelly, city manager, is about to make a study of various proposed power units for a new municipal power plant here to cost about $100,000. Work is expected to begin before the end of the year.

North Atlantic

MERIDEN, CONN.—International Silver Co. recently awarded contract for a 4-story plant to W. M. Bailey Co., 88 Bond street, Boston.

NEW HAVEN, CONN.—New York, New Haven & Hartford railroad has started work through Tredennick-Billings Co., 10 High street, Boston, for a central heating plant for the general offices, station and other railroad buildings here, estimated to cost $500,000.

WILMINGTON, DEL.—Delaware hospital, Fourteenth and Washington streets, closed bids April 15 for a power house. Clarence R. Hope, Equitable building, is architect.

WASHINGTON—Navy department, care E. H. May, director of purchases, advises that contract for extension to boilermakers' shop building at navy yard here has been let to Ira Thomas Brant, 944 Fourteenth street. (Noted March 27.)

BALTIMORE—Western Electric Co., Broening highway, closed bids recently for a 6-story manufacturing plant addition reported to cost $2,000,000. Architect and engineer are the company, care W. F. Hosford, 195 Broadway, New York.

WALTHAM, MASS.—Contract were recently let for the erection of a group of buildings for the Middlesex county hospital district, including power plant. C. S. Cunningham & Sons Construction Co., 80 Boylston street, Boston, have the general contract.

SECAUCUS, N. J.—New York Air Terminal Inc., 44 Wall street, New York, is said to be planning a large group of buildings here to include machine shops, manufacturing plants and hangars. Project is reported to cost approximately $1,000,000.

HADLEY, N. Y.—New York Power & Light Corp., care C. Miller, 126 State street, Albany, N. Y., has plans for a hydroelectric power plant and project here that is said to cost $4,000,000.

GERMANTOWN, PA.—Thomas S. Gassner Co., 2-story sheet metal works, Wayne avenue and Apsley street, was recently damaged by fire.

PHILADELPHIA—Ford Motor Co. has been granted a building permit for repair and reconditioning work on its 10-story assembly plant at Broad and Lehigh avenues. It is expected that about $50,000 will be spent in preparing the plant for resumption of automobile assembly, in conjunction with the assembly plant at the Ford plant in Chester, Pa., near here.

TRAFFORD, PA.—Westinghouse Electric & Mfg. Co. advises through J. B. George, works engineering department, East Pittsburgh, Pa., that contracts are being let for a 60 x 134-foot, 1-story plant building for the storage of material for the manufacture of micarta products.

WARREN, PA.—Pennsylvania Furnace & Iron Co., Pine street and Fourth avenue, advises through R. L. Blodgett, that new building, 70 x 200 feet, will be for the manufacture of gas furnaces for house heating. Company advises also it is adding to its crane facilities over the loading yard and will extend all five craneways now owned. (Noted April 10.)

Southern States

SHEFFIELD, ALA.—Negotiating committee headed by W. S. Hatch is endeavoring an unnamed plant to locate here on the site of the old Sheffield rolling mill, now owned by the Sloss-Sheffield Steel & Iron Co. If negotiations are successful the company will move equipment brought here from northern plants and also build a foundry and machine shop at an estimated cost of $350,000, construction of which would begin in May or June. Eventually an investment of $1,200,000 may be made.

PARAGOULD, ARK.—Common council is reported having plans for a light and power plant in connection with water works here which will cost in entirety, $225,000. W. A. Fuller Co., 2916 Shenando avenue, St. Louis, is engineer.

NEW ORLEANS—Wedell-Williams Air Service Inc. plans to build a plant for the manufacture of aircraft. Harry P. Williams is general manager.

SHREVEPORT, LA.—City, care H. E. Barnes, engineer, has awarded contract to K. C. Wilson, Slattery building, for construction of a municipal waterworks system and pump station at Cross lake, at $396,096 bid. (Noted March 13.)

SHREVEPORT, LA.—Commission council has appointed Jones, Roessle, Olschner & Weiner, Ardis building, as architects for new airport to be constructed at Free State plantation. Machine shops, hangars and administration buildings will be erected. H. E. Barnes, city engineer, is in charge of plans. (Noted Feb. 20.)

DECATUR, MISS.—Newton county agricultural college will take bids about April 20 for a 2-story science building and 1-story gymnasium costing about $90,000. R. C. Pugh is superintendent.

CHARLOTTE, N. C.—H. M. Wade Mfg. Co. plant, South Graham street, was recently damaged by fire. The company manufactures bank and store fixtures.

MIAMI, OKLA.—Cardin Machinery & Electric Co., Cardin, Okla., dealing in mining equipment, recently experienced fire loss amounting to $100,000 when office and shop were burned here. It is understood that a new building will be erected immediately.

SEMINOLE, OKLA.—Okmulgee Gas Engine Co., Okmulgee, Okla., is understood to be erecting a 40 x 80-foot branch shop here. Fred Korp is general manager of the company, which is a rebuilder of gas engines.

CHATTANOOGA, TENN.—Linde Air Products Co. and Prest-O-Lite Co. Inc., subsidiaries of Union Carbide & Carbon Corp., 30 East Forty-second street, New York, will start erection of two plants on Twenty-third street, here.

KNOVILLE, TENN.—Knoxville Iron Co. is building a 75 x 250-foot plant addition where rail steel bars will be produced by June 1. Present machinery from the bending shop will be moved to the new addition and no new equipment is reported needed.

MEMPHIS, TENN.—DeSoto Paint & Varnish Co., East Railroad street, recently awarded contract for a 1-story paint plant including a 35 x

35-foot boiler plant, to B. W. Construction Co., 720 Cass avenue, Chicago.

AMARILLO, TEX.—Plant for the manufacture of cabin airplanes is expected to be established here by E. E. Bidwell, Wichita, Kans.

AMARILLO, TEX. — Southwestern Public Service Co., 205 Planters' building, St. Louis, is doubling the capacity of its power plant here by an addition of 11,250 kilowatt generating capacity.

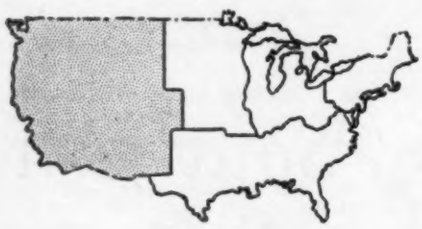
DALLAS, TEX.—Shops owned by the Dixie Motor Coach Corp., 605 Jackson street, were recently damaged by fire. Loss was estimated at $25,000. Company expects to rebuild.

West Central

DES MOINES, IOWA — American Metal Weatherstrip Co., 113 Locust street, suffered fire damage to building recently.

OTTUMWA, IOWA—City has been granted a permit by the federal trade commission to construct a 3600-horsepower capacity hydroelectric project across the Des Moines river on a site near here.

ST. PAUL—Warehouse belonging to the Dale street shops of the Great Northern railroad, Forty-second avenue and Perry street, Robbinsdale, was recently damaged by fire.



Western States

DENVER—Walter S. Peterson, 648 South Gilpin street, has been granted a permit for the erection of a 1-story, 37 x 44-foot shop at 1343 Santa Fe street. Ray Allen, 1835 South Emerson street, has the contract.

POCATELLO, IDAHO—Martin Spring Works, 941 North Harrison street, advises that they have plant building, 45 x 130 feet, now under construction. Machinery needs have not been decided upon, though equipment will be needed. (Noted March 20.)

CLAYTON, N. MEX.—Colorado Interstate Gas Co., care Cities Service Co., 60 Wall street, New York, is taking bids for a gas compressor plant here to cost about $500,000. Engineers are Ford, Bacon & Davis, 39 Broadway, New York.

SEATTLE—Campbell Mill Co., 501 West Spokane street, will remodel its lumber plant and construct a machine shop, 24 x 60 feet.

SHELTON, WASH.—Plans have been completed by J. H. Wohleb, architect, Olympia, Wash., for a diesel repair shop for the Peninsula railway. Structure will be 90 x 110 feet.

Canada

EDMONTON, ALTA.—Negotiations are announced under which the Dominion Bridge Co. Ltd. will co-operate with the Standard Iron Works Ltd., here, in development of its plant at 121st street and 106th avenue.

NELSON, B. C.—Canadian Pacific railway, Montreal, Que., recently announced through H. R. Younger, resident engineer here, that repair shop buildings to be erected here this year will include main building, 50 x 220 feet; blacksmith and machine shops will be a unit 25 x 75 feet; a secondary building, 28 x 163 feet, will be used for woodworking and air-brake testing. (Noted March 20.)

CROWLAND, ONT.—Page-Hersey Tubes Ltd., 100 Church street, Toronto, Ont., manufacturer of steel and wrought iron pipe, advises that negotiations are under way with township here for a fixed assessment for a proposed seamless tube plant. A by-law is to be voted upon April 25.

GLEN MILLER, ONT.—Miller Bros. machine shop and equipment were recently damaged by fire with a loss of $10,000.

PETERBOROUGH, ONT.—Canadian General Electric Co., 212 King street west, Toronto, Ont., awarded contract to T. A. Brown Co. for 1-story plant addition to cost about $400,000. Building will be an entirely welded structure and is expected to be completed within 150 days from about April 15. Plans call for two units, 80 x 400 feet, and the third, 80 x 100 feet. (Noted March 13.)

TORONTO, ONT.—Board of control, B. H. Wemp chairman, is receiving bids for one 5,670,000-gallon centrifugal pump and motor and the supply and installation of two 460-gallon centrifugal pumps and motors.

Recent Incorporations

MIAMI, FLA.—Sandquist Corp. has been incorporated by T. B. Hamilton, 128 North First street, to engage in engineering and construction.

AURORA, ILL.—Aurora Metal Cabinet Co. has been incorporated with 20,000 no par shares by Hall & Dusher, Suite 702, Rockford National Bank building, Rockford, Ill., to engage in general manufacturing.

CHICAGO—Westphal Co. Inc. has been incorporated with $10,000 capital by Irving Breakstone, 140 North Dearborn street, to manufacture and sell electric clocks.

CHICAGO—Macomber Engineering & Construction Co. Inc. has been incorporated with 3000 no par shares by Heth, Lister & Collins, 33 South Clark street, to engage in a general contracting business.

CHICAGO—Apex Electrical Engineering Co. has been incorporated with $20,000 capital stock by Robert J. Shapiro, 2005 Ridge road, Homewood, to engage in electrical work of all kinds.

PADUCAH, KY.—Follis Clutch Pedal Gear Co. has been incorporated for $25,000 by Edwin J. Paxton, 1409 Broadway.

NEW ORLEANS—Walter W. Barnes Electric Works has been incorporated with $3000 capital by Walter W. Barnes, president, 4214 Jena street.

HINGHAM, MASS.—George E. Kimball & Son Co. has been incorporated with $100,000 capital by George E. and James H. Kimball, to manufacture and deal in all kinds of materials, tools and implements used in the building and hardware industries.

BATTLE CREEK, MICH.—Midwest Farm Equipment Co. has been incorporated with 18,000 no par shares and $32,000 capital by Harry L. Carr, 4 New England street, to manufacture and sell farm implements and garden tools.

DETROIT—Consumers' Metal Corp. has been incorporated with $100,000 capital by Harry Gittlen, 60 Pleasant avenue, Grand Rapids, Mich., to refine, sell and deal in metals and metallic ores.

DETROIT—Redbon Mfg. Co. has been incorporated with $15,000 capital by Frank X. Bonem, 17235 Wanda avenue, to design, manufacture and sell mechanical and electrical appliances and devices.

(*Concluded on Page* 106)

*NIROSTA KA2

Nitralloy and Stainless Steels

Seamless Tubes
Bars
Billets
Slabs
Sheets
Plates
Wire
Hot Rolled Strip
Cold Rolled Strip

High-chrome, high-nickel alloy resistant to the corrosive action of air, salt water and acids at high temperatures and high pressures which may be welded, drawn, spun and highly polished.

ASSOCIATED ALLOY STEEL CO.

Union Trust Bldg., Cleveland

Sales Division For
Corrosion, Heat and Wear Resistant Alloy Steels For

Ludlum Steel Co. Watervliet, N. Y. Sharon Steel Hoop Co. Sharon, Pa.
Timken Steel & Tube Co. Canton, Ohio

District Offices

New York
Philadelphia
New Haven

Detroit
Cleveland
Cincinnati

Chicago
Los Angeles
San Francisco

Construction and Enterprise

(*Concluded from Page* 104)

DETROIT—Dalley & DuBois Inc. has been incorporated with 3000 no par shares by Fred C. Dalley, 464 West Jefferson street, to purchase and sell machinery, factory equipment, factory supplies and tools.

DETROIT—Detroit Equipment Co. has been incorporated with $9000 capital by Edward C. Whalen, 4-136 General Motors building, to manufacture, deal in and sell machinery and mechanical devices.

DETROIT—Stevens Roller Bearing Corp. has been incorporated with $50,000 capital by Daniel Stevens, 5913 Stanton avenue, to deal in and manufacture roller bearings and other automobile parts.

DETROIT—S. M. S. Products Co. has been incorporated with 2500 no par shares by H. A. Matthews, 288 Adelaide street, to manufacture and deal in parts, accessories and equipment for internal combustion engines, motors and motor vehicles.

HILLSDALE, MICH.—Hillsdale Machine & Tool Co. has been incorporated with $25,000 capital by Charles F. Sage, 50 Shrot street, to deal in tools, dies, and do a general manufacturing business.

ST. JOSEPH, MICH.—Michigan Forge & Machine Co. Inc. has been incorporated with $15,000 capital by Morrison Mills, 4837 Lakewood avenue, Detroit, to engage in general forging and machine work, and to manufacture and sell automobiles.

KANSAS CITY, MO.—Kansas City Aluminum Co. has been incorporated with $50,000 capital by E. J. Lind, 2114 North Thirteenth street, to operate an aluminum and metal foundry.

GLOCESTER, N. J.—S. P. Wilson Tool Co. has been incorporated with $300,000 capital by Howard E. Truax, 133 Haddon avenue, Camden, N. J., to manufacture tools.

NEWARK, N. J.—Acme Machine Co. Inc. has been incorporated with $100,000 capital by Irving T. Gelber, 293 Pomona avenue, to manufacture mill supplies.

NEW BRUNSWICK, N. J.—General Oilless Bearing Co. has been incorporated with $100,000 capital by Richard E. Potter, to manufacture bearings.

PATERSON, N. J.—Select-O-Light Corp. has been incorporated with $125,000 by Peter Cohn, attorney, 45 Church street, to manufacture auto lamps.

UNION CITY, N. J.—Airways Motors Inc. has been incorporated with $15,000 capital by William A. Schlosser, Hoboken, N. J., to manufacture self-propelling devices.

JAMESTOWN, N. Y.—Graves & Son Boiler Mfg. Co. has been incorporated with $25,000 capital by A. L. Laudenslager.

TRENTON, N. Y.—Square Stamping Co. has been incorporated with $751,000 preferred stock and 5000 common shares by A. C. Hall, 407 Northern road, Utica, N. Y., to stamp sheet Metal.

CLEVELAND—Steel-Maid Products Co. has been incorporated with 250 no par shares by A. R. Edgerton, 1019 Williamson building, to manufacture steel kitchen tables.

DAYTON, O.—Acme Pattern & Mfg. Co. has been incorporated with 500 no par shares by Robert K. Landis and Charles Hager.

COLUMBIA, PA.—Manor Metalcraft Corp. has been incorporated with $50,000 capital stock by William L. Kaufold, 530 North Plum street, Lancaster, Pa., to manufacture and sell metal materials and products.

New Trade Publications

LUBRICATION—Texas Co., New York, covers the subject of textile machinery lubrication in the current issue of its magazine devoted to lubrication problems in industry.

STEEL CASTINGS—Industrial Steel Casting Co., Toledo, O., sets forth in a bulletin the facilities it has for making steel castings for special purposes.

FOUNDRY CUPOLA—Whiting Corp., Harvey, Ill., is distributing to interested foundrymen reprints of two papers on operation of the foundry cupola by Dr. Edward E. Marbaker, director of foundry research for the company.

REFRACTORIES—Quigley Furnace Specialties Co. Inc., 56 West Forty-fifth street, New York, has issued a folder on its lining material. It explains the uses of the material in iron, steel and brass foundries.

SEAMLESS TUBING—Summerill Tubing Co., Bridgeport, Pa., tells in a leaflet how seamless steel tubing is drawn. An illustration shows a miniature draw bench and the text describes its operation for production of tubing.

TRAMRAIL—Handling of all types of packages by tramrail is covered in a bulletin by the Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O. Illustrations show typical installations.

STAINLESS STEEL CASTINGS—Shawinigan Stainless Steel & Alloys Ltd., Shawinigan Falls, Que., is circulating a folder which gives a history of the company, equipment and the alloy steels produced. The company specializes in steels and irons for heat and acid resistance.

FORGINGS—National Machinery Co., Tiffin, O., has issued a bulletin to illustrate the variety of machine parts which can be forged with economy and gain in strength. The group is taken from products of a concern using forging machines made by the National company.

INDUSTRIAL TRUCKS—Atlas Car & Mfg. Co., Cleveland, has issued a booklet on industrial trucks and tractors. Details of construction are explained and the various types with specifications are shown. Drawings show dimensions of the units. Several illustrations show services in which the trucks may be used.

CLEANING MACHINERY—Ideal Industrial Machinery division of the Consolidated C. M. Corp., Cincinnati, has published a booklet illustrating and describing various types of its tumbling, cleaning, loading and mixing machinery. The booklet also includes information on its air blast drier and chip separator.

BOILER WATER CONDITIONING — Hagan Corp., Pittsburgh, is distributing a booklet containing a treatise on its water conditioning chemical, prepared by Hall Laboratories Inc., Pittsburgh. The research covers development of this chemical for prevention of scale, corrosion and foaming in steam boilers. It contains much of value to steam boiler users.

NICKEL CAST IRON—International Nickel Co. Inc., New York, has prepared a booklet containing notes on uses of nickel cast iron. Applications are classified under five important industrial fields for ready reference by designing engineers or manufacturers of equipment employing cast iron. It is in handbook size for convenient use.

GRAPHIC TIME RECORDERS—Esterline-Angus Co., Indianapolis, describes in a current bulletin some of the uses to which its graphic time recorders can be put to give a permanent record of operations and events in industrial and other plants. The workings of the recorders are illustrated and their construction given in detail.

BELT CONVEYORS—Stearns Conveyor Co., Cleveland, a division of the Chain Belt Co., Milwaukee, has completed a catalog and engineering data book giving specialized information on designs and applications of Rex-Stearns Timken idlers for all types of belt conveyors, with allied and auxiliary equipment for complete belt conveyor installations.

BUCKETS AND CLAM SHELLS—The Hayward Co., 50 Church street, New York, has published two folders describing and illustrating the advantages, construction and operation of its electric motor buckets and digging clam shells. Illustrations show typical installations and specifications for each kind of apparatus are given.

SAND EQUIPMENT—Universal Sand Equipment Co., 1833 Columbus road, Cleveland, has issued a catalog on its sand handling and conditioning equipment. The booklet is illustrated with halftones of various types of equipment and typical installations. Data on various types of sand throwing machines, details of construction, layouts for sand handling systems and a list of users are included in the catalog.

CENTRIFUGAL PUMPS—Barrett, Haentjens & Co., Hazelton, Pa., manufacturers of centrifugal pumps, have published a series of bulletins on effective means for priming centrifugal pumps manually. The bulletins cover the theory of priming, submerged pumps, use of foot valves, air, steam and water ejectors, hand-operated and motor-driven priming pumps and arrangement of intake pipes.

STELLITE—A booklet by the Haynes Stellite Co., New York, deals with the use of stellite in the oil fields. It describes Haystellite, a tungsten carbide diamond substitute; Stellite, a hard-facing alloy of chromium, tungsten and cobalt; Hascrome, a chromium-manganese-iron welding rod for tying in Haystellite on cutting edges and building up badly worn parts preparatory to stelliting. The booklet is divided into seven parts, discussing various phases of oilfield work.

SAWS—John Royle & Sons, Paterson, N. J., has issued a descriptive booklet on its electrically driven saws for patternmakers and cabinet makers. Construction and design are explained in detail and the specifications given. Features of the machines when devoted to special uses are explained such as beveling gages, mitering gages, linotype slug cutters and micrometer attachments. Cabinet, column and circular saws and conditioning equipment are discussed. The company also has issued a 16-page booklet on its cabinet saw and jig saw and drill.

$60,000,000

Republic Steel Corporation

6% Cumulative Convertible Preferred Stock

Preferred over the common stock as to cumulative dividends at the rate of 6% per annum and as to assets, in case of voluntary liquidation, to the extent of $110 a share and accrued dividends, and in case of involuntary liquidation, to the extent of $100 a share and accrued dividends. Redeemable at any time, as a whole or in part, on thirty days' notice, at $110 a share and accrued dividends. Dividends payable quarterly on January 1, April 1, July 1 and October 1. The Serial Preferred Stock, of which the 6% Cumulative Convertible Preferred Stock is the initial series, may be issued in one or more series, with such variations in the terms and provisions of the several series and subject to such restrictions as are more fully set forth in the agreement of merger and consolidation. Transfer Agents: Guaranty Trust Company of New York, New York; Continental Illinois Bank & Trust Company, Chicago and The Cleveland Trust Company, Cleveland. Registrars: Irving Trust Company, New York; Central Trust Company of Illinois, Chicago and The Guardian Trust Company, Cleveland.

Convertible, at the option of the holder, into common stock of the Corporation on the following basis: on or before May 1, 1932, one share of preferred stock for one share of common stock; thereafter and on or before May 1, 1937, 1¼ shares of preferred stock for one share of common stock; thereafter and on or before May 1, 1942, 1½ shares of preferred stock for one share of common stock; and thereafter 1¾ shares of preferred stock for one share of common stock.

The following information has been summarized by Messrs. Tom M. Girdler and E. T. McCleary, Chairman of the Board and President, respectively, of Republic Steel Corporation, from their letter dated April 8, 1930, copies of which may be obtained upon request, and is subject to the more complete information contained therein:

THE COMPANY

Republic Steel Corporation is the third largest producer of steel in the United States, with an annual ingot capacity of more than 4,900,000 tons. The Corporation, organized under the laws of the State of New Jersey, owns or has acquired, by merger or purchase, substantially all of the assets (subject to liabilities) of Republic Iron and Steel Company, Central Alloy Steel Corporation, Donner Steel Company, Inc., The Bourne-Fuller Company and The Berger Manufacturing Company, pursuant to a Plan and Agreement dated January 15, 1930. Subsidiaries of the Corporation include, among others, Steel and Tubes, Inc., Union Drawn Steel Company and The Trumbull-Cliffs Furnace Company. Important recent acquisitions by constituent companies include the properties of Witherow Steel Company and Interstate Iron and Steel Company.

The Corporation's activities include all the important steps in steel making, from the mining and treatment of ore and other raw materials to the manufacture of a diversified line of finished products, the percentage of steel output converted into highly finished products and manufactured articles being greater than that of any other of the large steel companies. Large reserves of iron ore, coal and limestone are owned by the Corporation.

CAPITALIZATION

The capitalization of the Corporation, based upon the pro-forma consolidated balance sheet, as of December 31, 1929, referred to below, is as follows:

	Authorized	Outstanding
Funded debt (including subsidiaries)		$58,335,800
6% Preferred Stock of Subsidiary	$ 5,000,000	5,000,000
Serial Preferred Stock—$100 par value	150,000,000	
6% Cumulative Convertible Preferred Stock (this issue)		60,000,000
Common Stock—without par value	5,000,000 shares	1,985,212* shares

*In addition, 12,073 shares are in the Corporation's treasury, and 600,000 shares of common stock are reserved for conversion of this preferred stock. There are also outstanding options to purchase 200,000 shares of the Corporation's common stock at $75 per share and warrants or rights to purchase approximately 1,400 additional shares at varying prices.

EARNINGS

The following statement, prepared by Messrs. Ernst & Ernst, certified public accountants, shows the combined earnings of the constituent companies and their subsidiaries, for the four-year period ended December 31, 1929 (including, for the full period, earnings of the Corporation's present subsidiaries and earnings of companies whose properties have been acquired since the beginning of such period), after interest, depreciation and Federal Income Taxes, and deduction of annual dividend requirement of $300,000 on the preferred stock of a subsidiary, and reflecting certain minor adjustments resulting in a net charge against earnings.

1926	$14,407,232
1927	7,387,709
1928	14,982,846
1929	19,997,453

Net earnings, as shown above, averaged $14,193,810 per annum, equivalent to approximately 3.94 times the maximum annual dividend requirement on this issue of preferred stock. Such earnings for the year ended December 31, 1929, were over 5.55 times such requirement.

Although general business depression resulted in a curtailment of operations in the steel industry during the first quarter of 1930, such earnings of the constituent companies and their subsidiaries for that period, as indicated by preliminary figures, were substantially in excess of such preferred dividend requirements for the period.

ASSETS

The pro forma consolidated balance sheet of the Corporation and its subsidiaries, as of December 31, 1929 (prepared by Messrs. Ernst & Ernst on the basis of the balance sheets of the constituent companies as of said date and adjusted to give effect, among other things, to certain transactions in connection with the consummation of the Plan and Agreement and to the issuance of the outstanding preferred stock and common stock of the Corporation shown above), shows net tangible assets, after deducting all liabilities and reserves, equivalent to more than $370 per share of this issue of preferred stock outstanding. Current assets of $87,875,211 exceed the combined current liabilities and funded debt; cash and call loans alone being in excess of current liabilities of $16,514,621.

The common stock of the Corporation is listed on the New York Stock Exchange and the preferred stock has been approved for listing on said exchange on official notice of issuance and distribution.

We offer this stock, less approximately $47,218,000 par value accepted by, or reserved for, stockholders of the constituent companies in accordance with the above mentioned Plan and Agreement, when, as and if received by us, and subject to approval of legal proceedings by our counsel. It is expected that delivery will be made on or about April 22, 1930 in the form of temporary or definitive stock certificates.

Price $95 per share and accrued dividends, to yield over 6.30%

Otis & Co.

Guaranty Company of New York — **Harris, Forbes & Co.** — **Field, Glore & Co.**

The Union Trust Company of Pittsburgh — **Brown Brothers & Co.** — **The Equitable Corporation of New York**

The C. T. Securities Company — **Union Cleveland Corporation** — **The Guardian Trust Co.** — **Central United Co.**

J. G. White & Co., Inc. — **First Detroit Company, Inc.** — **The First National Old Colony Corporation**

Chemical National Company, Inc. — **Chatham Phenix Corporation** — **Mitchell, Herrick & Co.** — **Wick & Co.**

Schoellkopf, Hutton & Pomeroy, Inc.

Statistics and statements given herewith are not guaranteed by us, but are obtained from sources we consider to be reliable.

Pipe and Tube Prices—Plate Extras

Steel Pipe

(Base price $200 per ton)

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2 points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	47	21½
¼ and ⅜-inch	53	27½
½-inch	58	44½
¾-inch	62	50½
1 to 3-inch	64	52½

Lap Weld

2-inch	57	43½
2½ to 6-inch	61	49½
7 to 8-inch	58	45½
9 and 10-inch	56	43½
11 and 12-inch	55	42½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	43	26½
¼ and ⅜-inch	49	32½
½-inch	55	44½
¾-inch	60	49½
1 to 1½-inch	62	51½
2 to 3-inch	63	52½

Lap Weld

2-inch	55	44½
2½ to 4-inch	59	48½
4½ to 6-inch	58	47½
7 to 8-inch	54	41½
9 and 10-inch	47	34½
11 and 12-inch	46	33½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	44	34½
¾ to 1½-inch	47	37½
2 to 2½-inch	49	39½

To large jobbers these discounts are increased by 1 point and two supplementary discounts of 5 per cent on black, and 1½ points and two supplementary discounts of 5 per cent on galvanized.

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

	Black	Galv.
¼ and ⅜-inch	+11	+36
½-inch	23	5
¾-inch	28	11
1 and 1¼-inch	31	15
1½ and 2-inch	35	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	9
2½ to 3½-inch	28	12
4 to 6-inch	30	17
7 and 8-inch	29	16
9 to 12-inch	26	11

REAMED AND DRIFTED

2-inch to 6-inch—Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+13	+48
½-inch	23	7
¾-inch	28	12
1 to 2-inch	34	18

Lap Weld

2-inch	29	13
2½ to 4-inch	34	20
4½ to 6-inch	33	19
7 and 8-inch	31	17
9 to 12-inch	21	8

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

Jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized wrought iron pipe.

On extra or double extra strong pipe fitted with threads and couplings basing discount lowered 5 points from plain end price. Fitted with threads only, basing discount lowered 3 points for random lengths.

Boiler Tubes

Pittsburgh carload discounts

STEEL (Lap Weld)

2 and 2¼-inch	38 off
2½ and 2¾-inch	46 off
3-inch	52 off
3¼ to 3¾-inch	54 off
4-inch	57 off
4½ to 6-inch	46 off

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. Over 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

CHARCOAL IRON

1½-inch	1 off
1¾-inch	8 off
2 and 2¼-inch	13 off
2½ and 2¾-inch	16 off
3-inch	17 off
3¼ to 3½-inch	18 off
4-inch	20 off
4½-inch	21 off

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discounts reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

SEAMLESS COLD DRAWN

1-inch	61 off
1¼ and 1½-inch	53 off
1¾-inch	37 off
2 and 2¼-inch	32 off
2½ and 2¾-inch	40 off
3-inch	46 off
3¼ and 3½-inch	48 off
4-inch	51 off
4½, 5 and 6-inch	40 off

SEAMLESS HOT ROLLED

1¾-inch	37 off
2 and 2¼-inch	38 off
2½ and 2¾-inch	46 off
3-inch	52 off
3¼ and 3½-inch	54 off
4-inch	57 off
4½, 5 and 6-inch	46 off

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....55 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net price per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for lengths over 24 feet.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inch long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weight.

Over 100 to and including 110 inches	.05c
Over 110 to and including 115 inches	.10c
Over 115 to and including 120 inches	.15c
Over 120 to and including 125 inches	.25c
Over 125 to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 to and including 84 inches	.10c
Over 84 to and including 96 inches	.20c
Over 96 to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot..... .20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot to but not including 7.65 pounds square foot.... .20c

Plates ordered 7.65 pounds square foot .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, class A-B....	1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Floor plates are furnished only as rectangular plates in stock steel grade. No physical tests will be made on floor plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Three feet and over up to published limit of length, but not over 80 feet	No extra
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.25c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts (Including straight taper plates)

Additional extra ..... .20c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with reentrant angles)

Additional extra ..... .50c